



Bisgould Lands

Environmental Impact Study

Prepared for:

Thomasfield Homes
295 Southgate Drive
Guelph, ON N1G 3M5

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NATURAL RESOURCE SOLUTIONS INC.

Aquatic, Terrestrial and Wetland Biologists

Bisgould Lands Environmental Impact Study

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Thomasfield Homes in December 2025 to complete an Environmental Impact Study (EIS) in support of a proposed subdivision development located at 2699 Victoria Street North, Breslau. The subject lands, which include a main eastern parcel as well as a separate smaller property fronting onto Greenhouse Road, are known as the Biscould Lands. The properties total approximately 44 ha including a large wetland that is approximately 15 ha in size as well as a smaller wetland that is 0.6 ha and is located within an agricultural field. A regulated watercourse is mapped within the central portion of the large wetland and directs surface water from Kramp Road northwest toward Greenhouse Road.

An EIS has been requested by the Grand River Conservation Authority (GRCA) due to the presence of the regulated wetlands and the watercourse (Map 1). The Township of Woolwich Official Plan (2025) identifies natural features within the study area as well as potential significant habitats that must also be considered in the EIS. This EIS will assess the potential impacts of the proposed development on the wetland and other natural heritage features within the subject lands.

This report presents the available background information relating to natural heritage features and summarizes the results of field surveys that were completed in January 2026 as well as an existing data set related to the post-construction monitoring for the Hopewell Crossing subdivision to the west. Additional surveys are planned for spring and summer 2026 and an addendum EIS will be prepared. In review of the existing conditions, legacy data and original survey data, candidate and confirmed natural feature constraints have been identified. The EIS outlines mitigation measures that will protect the form and function of the wetland. Opportunities for ecological restoration of buffer areas will enhance the value of the natural feature as wildlife habitat.

This report has been prepared in accordance with the requirements outlined in the *Grand River Conservation Authority Environmental Impact Study Guidelines and Submission Standards for Wetlands* (GRCA 2005).

2.0 Project Scoping

2.1 Study Area

For the purpose of this report, the term “subject lands” refers to the two parcels that comprise the Bisgould Lands (Map 1). The term “study area” refers to the subject lands plus the surrounding area (approximately 120 m) for which additional information was collected and reviewed on any natural heritage features present (as could be gathered without direct access to these areas). Legacy data was also collected from agencies and wildlife atlases encompassing an area of approximately 1 to 10 km around the study area.

Much of the study area consists of annual row crop fields and the large wetland. Residential lots front onto Victoria Street, Greenhouse Road and Kramp Road with an industrial building and office complex also present. Two garden nursery businesses are present to the west and a cemetery is present to the east. Within the western block of the subject lands, a Union Gas compressor station is surrounded by a small area of cultural meadow. Several treed hedgerows are present; the largest located along the eastern property boundary shared with the cemetery.

Vegetation communities within the study area consist of shallow marsh, meadow marsh, swamp thicket, treed swamp, lowland forest and cultural meadow. The larger and smaller wetland units, as well as a small wetland to the west of Greenhouse Road, are mapped as part of the Breslau Provincially Significant Wetland Complex (MNR 2025). The study area is located within Ecoregion 6E.

2.2 Preliminary Background Review for Scoping

In order to determine a study approach for the EIS, existing natural heritage information was reviewed to identify key natural heritage features and species that are known or have potential to occur within the study area. The following background information sources were reviewed to provide an accurate understanding of the physical and biological attributes of the study area:

- Region of Waterloo Official Plan (2024);
- Township of Woolwich Official Plan (2025);
- East Side Subwatersheds Characterization Report (GRCA 2014)

- GRCA Web Map Application (2025);
- Natural Heritage Information Centre database (MNR 2025);
- Department of Fisheries and Oceans Aquatic Species at Risk Mapping (2025)
- Ontario Breeding Bird Atlas (BSC *et al.* 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019); and
- Atlas of the Mammals of Ontario (Dobbyn 1994);

Initial wildlife species lists were compiled using the various wildlife atlases to identify significant species reported from the vicinity of the study area. These initial species lists were used to screen for the potential presence of significant species based on the habitats that occur within the study area.

Based on these initial species lists, a total of 13 Species at Risk (SAR) and 11 Species of Conservation Concern (SCC) were identified as having records from the vicinity of study area. SAR are those listed on the Species at Risk in Ontario List (MECP 2025). These include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Species listed as Endangered or Threatened are protected by the *Endangered Species Act* (ESA), 2007, which includes protection of their habitat. At the time that this EIS was prepared, the provincial government is in the process of replacing the ESA with a new regulation known as the *Species Conservation Act* (SCA). The details of the SCA have not yet been formalized.

Species considered Special Concern are included in the definition of Species of Conservation Concern, which includes the following:

- species designated provincially as Special Concern,
- species that have been assigned a conservation status (S-Rank) of S1 to S3 or SH by the Natural Heritage Information Centre, and
- species that are designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act but not provincially by the Endangered Species Act.

Species of Conservation Concern are discussed further in the context of Significant Wildlife Habitat (SWH) (Section 5.3).

A preliminary screening exercise was conducted for these species to identify which may have suitable habitat within the study area. This involved cross-referencing the preferred habitat (OMNR 2000) against habitats that were confirmed to occur within the study area based on field surveys. The results of the SAR and SCC screening are provided in Appendix I.

A screening for the potential presence of SWH was also completed for the study area. The Significant Wildlife Habitat Technical Guide (SWHTG) is a guidance document that outlines the types of habitats that the MNR considers significant in Ontario as well as criteria used to identify these habitats (OMNR 2000, OMNR 2015). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of Species of Conservation Concern, and animal movement corridors. The SWH screening table is provided in Appendix II.

2.3 Terms of Reference and Agency Input

Based on the preliminary review of background data and the surveys conducted to date, a Terms of Reference (TOR) for the EIS was prepared by NRSI and submitted to the GRCA and Township on January 9, 2026 for review and comment. The GRCA reviewed the TOR, and on January 16, 2026 provided comments that were subsequently addressed (Heywood pers. comm. 2026). The TOR is provided in Appendix III.

2.4 Relevant Policies, Legislation, and Planning Studies

Table 1 provides an overview of natural heritage policies, regulations and legislation that have been considered for the study area. To inform suitable land use concepts, and identify areas to be protected or enhanced, the natural features were evaluated against the applicable policies. The implications of these policies on the proposed development are discussed in Section 5.0.

Table 1. Relevant Policies, Legislation and Planning Studies

Policy/Legislation	Description	Project Relevance
Provincial Policy Statement (OMMAH 2024).	• Issued under the authority of Section 3 of the Planning Act and replacing the 2020 PPS. • Section 2.1 of the PPS – Natural Heritage establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant'. • The Natural Heritage Reference Manual (OMNR 2010) and the Significant Wildlife Habitat Technical Guide (OMNR 2000, MNRF 2015) were prepared by the MNRF to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS.	• Natural features that occur or may occur within the study area, and which receive protection under the PPS, include: • Significant Wetlands, • Fish Habitat, • Potential Significant Wildlife Habitat, and • Potential habitat for Endangered and Threatened species.
<i>Endangered Species Act</i> , (Government of Ontario 2007)	• The ESA prohibits killing, harming, harassing or capturing Endangered and Threatened species and protects their habitats from damage and destruction. • The ESA will soon be repealed and replaced with the <i>Species Conservation Act</i>. The exact details of habitat definitions and what protections will be afforded are not yet known.	• A preliminary review identified several regulated SAR as having the potential to occur within the study area based on the habitats present. • The SAR screening table (Appendix I) outlines these species.
<i>Fisheries Act</i> , 1985 (Government of Canada 1985)	• Proposed amendments to the Fisheries Act were introduced in 2018 to restore lost protections and incorporate modern safeguards. On August 28, 2019, the new, "modernized" Fisheries Act came into force and includes new protections for fish and fish habitat in the form of standards, codes of practice, and guidelines for projects near water. • The modernized Act provides protection for all fish and fish habitat and prohibits the harmful alteration, disruption or destruction of fish habitat. • The DFO Canada's Fish and Fish Habitat Protection Program ensures compliance with relevant provisions under both the Fisheries Act and the Species at Risk Act. The program reviews proposed works, undertaking and activities that may impact fish and fish habitat. • Works that are proposed in and around certain types of waterbodies may not require DFO review. Likewise, if proponents can follow all specified measures to protect fish and fish habitat outlined by DFO, review may not be necessary.	• The unnamed tributary and municipal drains on and adjacent to the subject property have the potential to provide direct fish habitat. • The need for project review by the Department of Fisheries and Oceans (DFO) Fish and Fish Habitat Protection Program (FFHPP) will be determined upon the completion of a proponent-led assessment of whether the proposed undertaking can meet all measures to protect fish and fish habitat (as outlined in the DFO's online Projects Near Water guidelines). • Should the proponent-led assessment indicate that impacts to fish and fish habitat may occur as a result of the proposed development, project review by the DFO will be necessary to determine if the proposed undertaking has the potential to contravene the Fisheries Act, and if an Authorization under the Act will be required. • Crossing locations over watercourses will need to consider the Fisheries Act.

Policy/Legislation	Description	Project Relevance
Township of Woolwich Official Plan (2025)	• The Township of Woolwich Official Plan (OP) (2025) outlines current policies for the protection of the Township's environmental features which provide the foundation for the Greenlands Network. • The Greenlands Network is comprised of Landscape Level Systems, Core Environmental Features, Fish Habitat, Supporting Environmental Features, and Environmental Linkages. • The OP also identifies natural hazards within which development will typically be restricted. • The policies of the Region OP (2024) are now implemented through the Township OP.	• Core Environmental Features that have been identified or may be present within the study area include: ○ Habitat of Endangered and Threatened Species; and ○ Provincially Significant Wetlands • Fish Habitat may be associated with the unnamed tributary. • Supporting Environmental Features that have been identified or may be present within the study area include: ○ Locally significant wetlands; ○ Significant Wildlife Habitat; and ○ Permanent or intermittent watercourses.
Ontario Regulation 41/24 (Government of Ontario 2024)	• Regulation issued under <i>Conservation Authorities Act</i>, R.S.O. 1990. • Through this regulation, the GRCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, and slopes). • GRCA requires that an EIS be undertaken in accordance with their <i>EIS Guidelines and Submission Standards for Wetlands</i> where development is proposed within 120 m of PSW or 30 m of non-PSW (GRCA 2005).	• The GRCA regulates a large portion of the subject lands and study area as the land is within its regulatory area associated with the Breslau Wetland Complex and a mapped watercourse. • Permitting from the GRCA must be obtained for proposed works within their regulation area.

3.0 Field Methods

The type and scope of study methods was determined in consultation with the GRCA and Township and is detailed in the TOR (Appendix III). A total of 5 field visits to the site were conducted between April 2025 and January 2026. A number of years of calling anuran and marsh bird surveys have been completed in relation to the adjacent Hopewell Creek subdivision monitoring which includes the large wetland feature on the subject lands. A summary of the completed and planned surveys is shown in Table 2. Additional survey effort is planned for spring and summer 2026. The survey stations are indicated on Map 2.

3.1 Terrestrial Field Surveys

Terrestrial field surveys have commenced within the study area to characterize the natural features and identify significant and sensitive habitats and species that have potential to be adversely affected by the proposed subdivision development.

3.1.1 Vegetation Surveys

Vegetation Community Delineation

The existing vegetation communities were delineated using aerial photography and thorough a field survey conducted on January 8, 2026 (Map 2). The standard Ecological Land Classification (ELC) System for southern Ontario was applied (Lee *et al.* 1998). Details were recorded including species composition, dominance, approximate age of the community, uncommon species or features, evidence of human impact, and surficial soil characterization where possible. The dripline of treed features will be surveyed in May 2026 and this layer provided to the team to inform the extent of natural feature buffer.

Vascular Flora Inventory

All species of vascular flora observed within the subject lands were recorded during the January 8, 2026 site visit. Due to timing, this survey focused primarily on tree and shrub species. The TOR identifies that a two-season (spring and summer) vascular flora inventory will be conducted in the study area in 2026 to supplement the preliminary plant species list and to document the herbaceous flora in greater detail.

Table 2. Summary of Field Surveys Completed in 2025-2026

Survey Type	Protocol	Date(s) ¹
Herpetofauna		
Calling Anuran Survey	BSC <i>et al.</i> 2009	April 10, 2025
		May 8, 2025
		June 19, 2025
Vegetation		
Ecological Land Classification	Lee <i>et al.</i> 1998	January 8, 2026 May 2026
Vascular Flora Inventory	Systematic area search	January 8, 2026 May 2026 June 2026
Wetland Boundary Review ²	N/A	May 2026
Tree Inventory	N/A	January 8-9, 2026
Significant Wildlife Habitat		
Significant Wildlife Habitat Assessment	N/A	January 8, 2026 May 2026
Birds		
Breeding Bird Survey	BSC <i>et al.</i> 2006	June 2026
Marsh Breeding Bird Survey	BSC 2001	June 4, 2025
		June 19, 2025
Bats		
Bat Habitat Assessment	OMNR 2011	January 8-9, 2026 May 2026
Aquatics		
Aquatic Habitat Assessment	Stanfield 2017, Bain and Stevenson 1999	January 13, 2026 May 2026

¹Surveys to occur in spring and summer 2026 are shown in **bold font**, including confirmation of findings from winter 2026.

²Wetland boundaries were delineated by another consultant 10+ years ago and this task will be updated in May 2026.

3.1.2 Wetland Boundary Delineation

The boundaries of the wetlands were delineated by another consultant more than 10 years ago. NRSI will re-flag the boundary and arrange a field visit with GRCA staff in May 2026. All mapping of wetlands and wetland buffers in this report, as well as on

engineering drawings and the conceptual development plan, utilize the existing GRCA wetland layer.

3.1.3 Tree Inventory

A comprehensive inventory of all trees ≥ 10 cm in Diameter at Breast Height (DBH) was completed by an NRSI Certified Arborist on January 8 - 9, 2026. The survey focused on areas where grading has the potential to directly or indirectly impact trees. The methods employed in the completion of the tree inventory are described in the TPP (NRSI 2026).

3.1.4 Bat Habitat Assessment

A leaf-off bat habitat assessment was conducted in January 2026 during the tree inventory. NRSI's Certified Arborist, who is trained and experienced in the MNRF bat habitat assessment protocol (OMNR 2011), visually scanned all trees ≥ 10 cm DBH for the presence of features (i.e., cavities, loose bark, etc.) that may provide bat maternity colony habitat. All candidate trees were noted and a follow-up assessment is planned for May 2026.

3.1.5 Breeding Bird Surveys

Breeding bird surveys will be completed between June and early July 2026. Map 2 indicates the 4 locations where point count surveys will be completed. The surveys will occur between 30 minutes before sunrise to 4 hours after in suitable weather conditions. All visual and auditory observations of birds will be recorded as well as the highest level of breeding evidence exhibited for each recorded species.

3.1.6 Marsh Breeding Bird Survey

Surveys of marsh birds have been completed by NRSI for a total of 11 years between 2012 through 2025 as part of ongoing monitoring for a neighbouring property. A call playback survey targeting several marsh bird species was conducted at each survey station. The 2 survey stations are indicated on Map 2. This EIS will utilize the existing data set and no surveys are planned to occur in spring 2026.

3.1.7 Anuran Call Surveys

Evening anuran (frog and toad) call surveys have been conducted by NRSI on the subject lands for a total of 11 years between 2012 through 2025 as part of ongoing monitoring for a neighbouring property. The 2 monitoring stations are shown on Map 2.

This EIS will utilize the existing data set and no surveys are planned to occur in spring 2026. The previous surveys were conducted following the methods outlined in the Marsh Monitoring Program for Amphibians (BSC 2009) with one evening visit in each of April, May, and June under suitable weather conditions. Monitoring focused on calling frogs and toads during three-minute call counts, which included call intensity and an estimated number of individuals. Additional information, including survey time, air and water temperature, pH, wind speed, and cloud cover were recorded at each survey station, where possible.

3.1.8 Additional Wildlife

All observations of mammals, herpetofauna, and insects were documented on all field visits conducted to date and will be recorded on subsequent surveys later in 2026. This includes direct observations of individuals, as well as signs of wildlife presence (i.e. tracks, scats, dens, nests etc.).

3.2 Aquatic Field Surveys

Aquatic biologists from Natural Resource Solutions Inc. conducted a preliminary visit to the subject lands and study area on January 13, 2026. During this site visit a detailed characterization of aquatic habitats was completed within the subject property.

3.2.1 Aquatic Habitat Assessment

NRSI biologists completed preliminary aquatic habitat characterizations within the subject lands during the winter of 2026. This aquatic habitat assessment was intended to identify potential aquatic habitat features within the study area for further assessment during the spring and summer of 2026. The locations where aquatic habitat was assessed are shown on Map 2. The surveys followed a modified version of the standard Ontario Stream Assessment Protocol and the methods described in *Aquatic Habitat Assessments Common Methods* (Stanfield 2017, Bain and Stevenson 1999). The following information was recorded during the surveys:

- Adjacent land cover characteristics (e.g., land use, canopy, riparian habitat),
- Channel morphology (e.g., bankfull and wetted widths, bank height, planform),
- Substrate type and composition,
- Available habitat and fish cover,
- General flow conditions (e.g., water depths, riffle/run/pool features),
- In-situ water quality parameters (water temperature, conductivity, dissolved oxygen, etc.),
- Potential Fish and Fish Habitat Features (e.g. seasonal, intermittent, permanent, contributory), and,
- Critical life stage areas for fish (e.g., spawning, nursery habitat, etc.).

4.0 Existing Conditions

4.1 Soils, Terrain and Drainage

The study area is located in the Grand River watershed which consists of an area of approximately 6,800 km² and falls under the jurisdiction of the GRCA. An unnamed tributary of Hopewell Creek bisects a large wetland on the property and this mapped watercourse was historically an anthropogenic channel intended to drain the wetland for agricultural land use.

The topography within the study area is gently sloped toward the large wetland with a slight grade change across the western block of upland along Greenhouse Road and a more pronounced slope within the larger eastern field. The existing elevation in the northeast of the site is approximately 330 m.a.s.l. while the eastern edge of the large wetland is situated at approximately 325 m.a.s.l. Most runoff collected across the site is directed to the large wetland with the exception of a small area in the far northeast that directs surface water northeast toward Victoria Street. The existing drainage catchments are shown on Figure 3 of the Crozier drawing package. The farmer that rents the land indicated that the field does not contain any tile drains.

The dominant soil type within the study area is moderately well-drained silty loam till (Presant and Wicklund 1971). The field survey determined that the larger wetland includes a shallow (~20 cm) layer of organic material within a central area of inundated cattails and the soil profile transitions to strictly mineral substrate around the perimeter of the feature. The smaller wetland does not exhibit a notable layer of organic material.

4.2 Designated Natural Areas

According to the GRCA (2025) and MNR (MNR 2025) online mapping applications, there are two provincially designated natural features within the study area, both are units of the Breslau Provincially Significant Wetland (PSW) complex (Map 1). As a result of the mapped PSW, these wetlands are also identified in the Region and Township Official Plans as Core Environmental Feature (Region of Waterloo 2024, Township of Woolwich 2025).

4.3 Vegetation

4.3.1 Vegetation Communities

The natural features within the subject lands include two wetlands; the larger of which is bordered by areas of meadow and forest. In the eastern field, both wetlands have been subject to field cultivation up to the edge of the feature which limits or eliminates any riparian cover under the current conditions. ELC communities are described in Table 3 and shown on Map 2. The wetland boundaries have not been field verified and a site visit with GRCA staff is planned for spring 2026.

The species that comprise these communities reflect a history of land disturbance and the entirety of the site was in agricultural production in the mid-1950s (Figure 1) which may have extended into the 1960s and 1970s. The older poplar trees on site suggest that the natural portions of the property have established over the past 30-40 years.

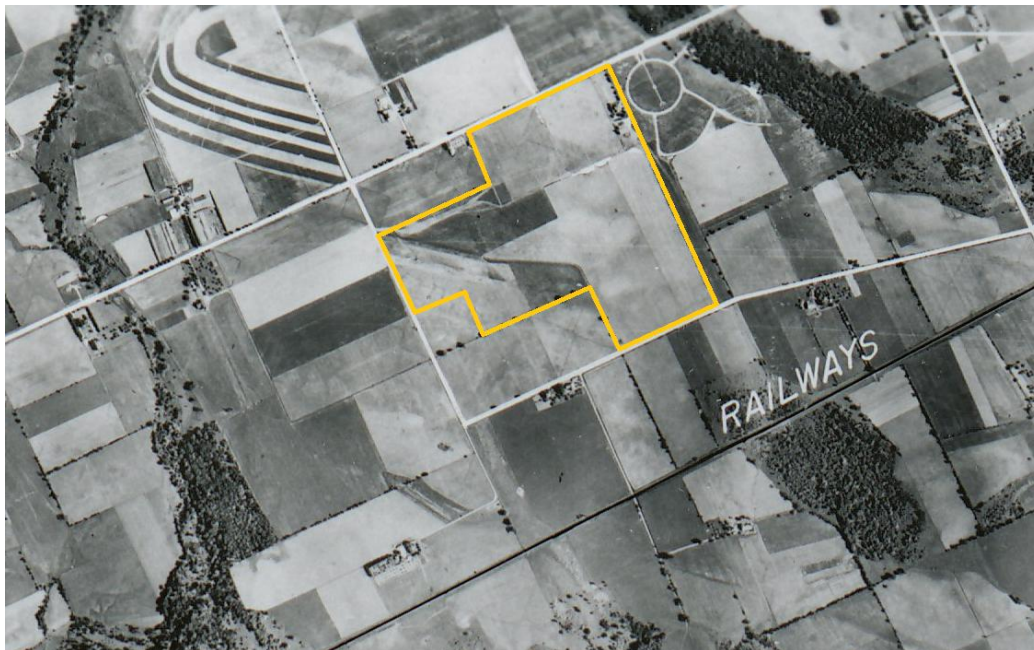


Figure 1. Aerial image of the study area in 1954 showing extensive cropland bisected by a channel (University of Toronto 2025).

Table 3. Vegetation Communities Identified within the Study Area

ELC Code	Community Type	Community Description
CUM1-1	Dry-Moist Old Field Meadow Type	An old field meadow on mesic soil along the eastern edge of Greenhouse Road. A Union Gas compressor station was recently constructed in the northern extent. <u>Canopy:</u> The very sparse tree cover (~1%) is comprised of young Trembling Aspen (<i>Populus tremuloides</i>) and Manitoba Maple (<i>Acer negundo</i>) saplings. <u>Understory:</u> The meadow is in the early stages of succession toward shrub thicket with stems of Gray Dogwood (<i>Cornus racemosa</i>) and Common Buckthorn (<i>Rhamnus cathartica</i>), an invasive species, scattered throughout. Young trees and shrubs become more prevalent toward the wetland edge in the area of proposed buffer. <u>Groundcover:</u> The groundcover is a mixture of native and non-native species including Kentucky Bluegrass (<i>Poa pratensis</i>), Goldenrods (<i>Solidago</i> sp.), Smooth Brome (<i>Bromus inermis</i>), Orchard Grass (<i>Dactylis glomerata</i>), New England Aster (<i>Symphyotrichum novae-angliae</i>) and Grass-leaved Goldenrod (<i>Euthamia graminifolia</i>).
FOD7	Fresh-Moist Lowland Deciduous Forest Type	Two areas of forest are present in the southwest portion of the property. The eastern feature is mid-age and has contiguous canopy while the western feature is younger with patchy canopy. <u>Canopy:</u> The canopy is mid-age Trembling Aspen ranging from 60-80% canopy cover. <u>Sub-canopy:</u> The sub-canopy is Trembling Aspen with a small proportion of Manitoba Maple and American Elm (<i>Ulmus americana</i>). <u>Understory:</u> Common Buckthorn and Glossy Buckthorn (<i>Frangula alnus</i>) occur throughout the understorey. Shade-suppressed stands of Gray Dogwood are also present and reflect the more open conditions that would have been present 20-30 years ago. The understorey is generally dense with shrubs which become impenetrable as you approach the edge of the wetland. <u>Groundcover:</u> The groundcover is limited to Avens (<i>Geum</i> sp.), Calico Aster (<i>Symphyotrichum lateriflorum</i>) and Lance-leaved Aster (<i>S.</i>

ELC Code	Community Type	Community Description
		<i>lanceolatum</i>), Woodland Agrimony (<i>Agrimonia gryposepala</i>) and depauperate Goldenrod.
SWD4-5	Poplar Mineral Deciduous Swamp Type	The two areas of poplar swamp to the east of the large marsh are similar to the FOD7 community but contain seasonal standing water and exhibit soil mottling near the surface confirming hydric conditions at these locations. <u>Canopy:</u> Trembling Aspen is dominant with few American Elm present. <u>Sub-Canopy:</u> Trembling Aspen and American Elm occur throughout the understorey with Green Ash (<i>Fraxinus pennsylvanica</i>), most of which have been affected by Emerald Ash Borer. <u>Understorey:</u> In close proximity to the willow thicket swamp community, the understorey in the treed swamp also includes an abundance of shrubs such as Sandbar Willow (<i>Salix interior</i>), Pussy Willow (<i>S. discolor</i>), Red Osier Dogwood (<i>Cornus sericea</i>) and the non-native Glossy Buckthorn. <u>Groundcover:</u> The spring ephemeral groundcover is limited in these areas due to the shallow standing water until May or June. Later in the growing season Calico Aster is common on hummocks in the swamp and the smaller feature in the field contains patches of non-native Reed Canary Grass (<i>Phalaris arundinacea</i>).
SWT2-2	Willow Mineral Thicket Swamp Type	The southern extent of the larger wetland is a dense swamp thicket that has formed along an old (75 years+) drainage channel through a low-lying area. <u>Canopy:</u> Sparse young Trembling Aspen and American Elm are present. <u>Understorey:</u> This community is a well-established thicket of Sandbar Willow, Pussy Willow and the non-native Glossy Buckthorn. Red Osier Dogwood is scattered throughout. <u>Groundcover:</u> The groundcover is limited due to the density of shrubs but species like Lance-leaved Aster and cattails are present in gap areas and more prevalent closer to the shallow marsh to the north.

ELC Code	Community Type	Community Description
MAS2-1	Cattail Mineral Shallow Marsh Type	The central portion of the larger wetland is a 7-hectare expanse of shallow marsh that contains standing water throughout much of the year. The centre of the marsh includes an old drainage channel and an accumulation of organics is evident in the central area where water depth can reach 0.5 - 0.75 m. <u>Groundcover:</u> The marsh is a near monoculture of cattail (<i>Typha</i> spp.) with Reed Canary Grass around the fringe and localized patches of non-native European Reed (<i>Phragmites australis</i> spp. <i>australis</i>). Lesser Duckweed (<i>Lemna minor</i>) covers much of the standing water among the inundated cattails.
MAM2-2	Reed-canary Grass Mineral Meadow Marsh Type	Over half of the eastern edge of the larger wetland is a low-diversity swath of Reed-canary Grass. The outer portion of this community has periodically been cultivated along the field edge. <u>Groundcover:</u> Almost entirely Reed-canary Grass, transitioning to cattails at the western edge and agricultural weeds at the eastern edge.

4.3.1 Vascular Flora

A preliminary list of plant species was compiled in winter 2026 and focused on woody species. A total of 46 species were documented and this list will be supplemented with additional survey effort in the spring and summer. The list of vascular plants is provided in Appendix IV.

Data from the NHIC (MNR 2025) indicates that Butternut (*Juglans cinerea*) is known from the vicinity. This species was not observed within the subject property during the ELC survey or during the tree inventory. No other federally or provincially significant plant species are known from the study area.

Although the spring and summer survey effort has yet to be completed, the vegetation communities are young to mid-age and reflect past disturbance. As a result, the likelihood that significant plant species occur within the subject lands or specifically within the proposed development area is low.

4.3.2 Tree Inventory

A total of 99 trees comprising 19 species, plus tree hedgerow tallies, were inventoried from the subject lands. Full results of the tree inventory are described in the Tree Preservation Plan.

4.4 Wildlife

4.4.1 Birds

In total, 111 bird species are reported from the vicinity of the study area based on the OBBA (BSC *et al.* 2006), and the NHIC (MNR 2025). The OBBA data includes those species that have been observed in the area (overlapping 10 x 10 km atlas square) that are known to nest in the area, and/or have exhibited some evidence of breeding in the area. Of these, 44 species have been documented within the study area during marsh breeding bird surveys conducted over the course of 11 years between 2012 and 2025.

Targeted breeding bird surveys have not yet been completed within the subject lands to determine which species exhibit confirmed, probable or possible breeding evidence. The background OBBA and NHIC data, as well as the marsh breeding bird species documented by NRSI, is provided in Appendix IV.

The background review indicated that 12 significant bird species have been reported within the vicinity of the study area (Appendix I). During the habitat screening, it was determined that suitable habitat may be present for Eastern Wood-pewee (*Contopus virens*) and Barn Swallow (*Hirundo rustica*). Eastern Wood-pewee has not been recorded during marsh bird surveys, but suitable habitat is present within the treed swamp and lowland forest areas. Barn Swallow has been observed foraging over the large wetland, but it is not certain if this species nests in the vicinity of the residence and outbuildings in the northeast of the site.

Several bird species that are considered regionally significant (Martin 1996) have been documented utilizing the large wetland. These species include Sora (*Porzana carolina*), Pied-billed Grebe (*Podilymbus podiceps*), Great Blue Heron (*Ardea herodias*), American Bittern (*Botaurus lentiginosus*), Green Heron (*Butorides virescens*), Alder Flycatcher

(*Empidonax alnorum*) and American Redstart (*Setophaga ruticilla*). All of these species are strongly associated with the large marsh and swamp thicket.

4.4.2 Herpetofauna

According to the Ontario Amphibian and Reptile Atlas (Ontario Nature 2019) and the NHIC (MNR 2025), 19 species of herpetofauna are known from the vicinity of the study area. The background information review and SAR/SCC screening indicated that suitable habitat is present for Snapping Turtle (*Chelydra serpentina*) and Western Chorus Frog (*Pseudacris triseriata*).

Snapping Turtle has been observed in the vicinity of the marsh and on local roadways within several hundred metres of the subject lands. It is very likely that this species overwinters within the marsh and also uses the wetland for basking and foraging.

Calling anuran surveys conducted between 2012 and 2025 have documented 6 frog and toad species within the large wetland including Spring Peeper (*Pseudacris crucifer*), Green Frog (*Lithobates clamitans*) and Northern Leopard Frog (*L. pipiens*). The size of the feature and the prolonged hydroperiod provide excellent habitat for these species. Western Chorus Frog has not been recorded over the course of 11 years of calling anuran surveys that have occurred between 2012 to 2025 and it appears that this species does not occur within the study area. A list of reptile and amphibian species known from the vicinity of the study area is provided in Appendix IV.

4.4.3 Mammals

According to the Mammal Atlas of Ontario (Dobbyn 1994), 46 mammal species are reported from the atlas square that overlaps the study area. To date, no observations of mammals have been made from the subject lands and surveys in spring and summer 2026 will document any observations made. Appendix IV provides a complete list of mammal species reported from the study area.

Based on the preliminary assessment of habitat and the SAR/SCC habitat screening process, the subject lands may contain suitable habitat for 7 bat species. These species include Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*M. septentrionalis*), Eastern Small-footed Myotis (*M. leibii*), Tri-colored Bat (*Perimyotis subflavus*), Silver-

haired Bat (*Lasionycteris noctivagans*), Eastern Red Bat (*L. borealis*) and Hoary Bat (*L. cinereus*). Candidate bat habitat trees were documented from the subject lands during the January 2026 tree inventory. These trees are primarily associated with the cedar hedgerow along the driveway of the residence in the far northeast. The large marsh may be used by Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*L. cinereus*) and Tri-coloured Bat as foraging habitat. Further assessment in 2026 will determine the suitability of habitats and will inform the need for targeted acoustic surveys. Appendix I provides a summary of significant bat species reported from the vicinity of the study area, including their current status and preferred habitats.

4.5 Aquatic Habitat

Aquatic habitat features within the study area were assessed as unnamed tributaries of Hopewell Creek, draining north from the subject lands before its confluence with the Grand River. The Study Area falls within the Middle Grand River Subwatershed, draining an approximate 600 km² area through 722 km of distinct watercourses and 65 km² of wetland features (GRCA 2019).

Site-specific habitat characterizations were completed for the portions of the Unnamed Tributary of Hopewell Creek within the Study Area, as described below.

4.5.1 Tributary of Hopewell Creek (AHP-001)

The downstream most reach of the Tributary of Hopewell Creek within the Subject Property directs flows North-West across Greenhouse Road directing flows into the adjacent Stormwater Management Facility near the intersection of Greenhouse Road and Highway 7. Aquatic habitat characterization of this reach (AHP-001) was completed on January 13, 2026 within the area ~50 m upstream of the Greenhouse Road culvert crossing structure.

Within this reach, the Tributary is characterized as an intermittent/ephemeral watercourse directing flows along the heavily vegetated roadside drain before crossing Greenhouse Road at a 0.25 m CSP culvert structure. During winter 2026 surveys the onsite wetland feature was observed to be in a frozen flooded condition and be hydrologically connected to the offsite agricultural pond located beyond the northwestern corner of the subject property. Near complete ice cover obscured the characterization of flow conditions within the Tributary, however flowing water at the culvert crossing

structure confirmed the flow direction and hydrological connection between the existing Hopewell Creek subdivision stormwater management feature and the aquatic habitat features within the subject lands. Within the roadside drain feature, riparian habitat consisted largely of European Reed, willows and dogwoods, with evidence of channelization and periodic vegetation removal. Localized bank erosion suggests periodic high-flow conditions through this reach.

Bankfull dimensions ranged from 1.5 - 1.75 m in width and 0.15 - 0.25 m in depth, with wetted widths ranging from 0.75 - 1.15 m. Substrates consisted primarily of sand and silt, with localized patches of gravel and accumulated detritus. No submerged aquatic vegetation was observed.

Surface water quality collected on January 13, 2026 (0730 hr; air temperature 0° C), recorded the following conditions:

- pH: 7.15
- Surface Water Temperature: 1° C
- Conductivity: 1.15 µs/cm (Total Dissolved Solids 525 ppt)
- Dissolved oxygen: 7.75 ppm (85.2 % saturation)

No barriers to upstream fish passage were observed between this reach and downstream resources. No fish or other aquatic species were observed within this assessment reach.

4.5.2 Tributary of Hopewell Creek (AHP-002)

Within the subject lands, the Tributary of Hopewell Creek flows in a general westerly direction within a historically channelized channel through the wider wetland habitat feature. Aquatic habitat characterization of this reach (AHP-002) was completed on January 13, 2026 within an ~75 m reach within the subject property.

Within this reach, the Tributary is characterized as an intermittent/ephemeral watercourse directing flows along a historically channelized area within the wetland habitat. During winter 2026 surveys, the onsite wetland feature was observed to be in a frozen flooded condition with frozen surface water extending well beyond the boundaries of the historically channelized area. Complete ice cover obscured the characterization of flow conditions within the Tributary. Within the flooded wetland feature riparian habitat

consisted largely of Broad-leaved Cattail (*Typha latifolia*) giving way to European Reed and deciduous shrubs near the roadside drain feature. The extent of flooded frozen conditions and lack of terrestrial vegetation suggest that this reach of the Tributary of Hopewell Creek is subject to periodic high-flow conditions.

Due to the flooded and frozen conditions and local snowpack bankfull and wetted dimensions could not be accurately characterized. Substrates consisted primarily of accumulated organic detritus. No submerged aquatic vegetation was observed.

Surface water quality collected on January 13, 2026 (0800 hr; air temperature 0° C), recorded the following conditions:

- pH: 7.25
- Surface Water Temperature: 0° C
- Conductivity: 0.75 µs/cm (Total Dissolved Solids 425 ppt)
- Dissolved oxygen: 5.15 ppm (65.3 % saturation)

No barriers to upstream fish passage were observed between this reach and downstream resources. No fish or other aquatic species were observed within this assessment reach.

4.5.3 Tributary of Hopewell Creek (AHP-003)

Within the subject lands, this reach of the Tributary of Hopewell Creek flows in a general westerly direction within a historically channelized channel through a deciduous shrub dominated wetland habitat feature. Aquatic habitat characterization of this reach (AHP-003) was completed on January 13, 2026 within an ~50 m reach within the subject property.

Within this reach, the Tributary is characterized as an intermittent/ephemeral watercourse directing flows through a poorly defined channel along a historically channelized reach. During winter 2026 surveys, the onsite wetland feature was observed to be in a frozen flooded condition with frozen surface water extending well beyond the boundaries of the historically channelized area. Near complete ice cover obscured the characterization of flow conditions within the Tributary, however gaps in ice coverage confirmed hydrologic connection and direction of surface water flows. Within

the deciduous wetland feature riparian habitat consisted of terrestrial grasses with traces of European Reed more dominant nearer the roadside drain feature.

Due to the flooded and frozen conditions and local snowpack, bankfull and wetted dimensions could not be accurately characterized. Substrates consisted primarily of accumulated organic detritus. No submerged aquatic vegetation was observed.

Surface water quality collected on January 13, 2026 (0900 hr; air temperature 0° C), recorded the following conditions:

- pH: 7.05
- Surface Water Temperature: 0° C
- Conductivity: 0.55 µs/cm (Total Dissolved Solids 315 ppt)
- Dissolved oxygen: 5.25 ppm (68.4 % saturation)

No barriers to upstream fish passage were observed between this reach and downstream resources. No fish or other aquatic species were observed within this assessment reach.

4.5.4 Tributary of Hopewell Creek (AHP-004)

The upstream most reach of the Tributary of Hopewell Creek within the subject lands directs flows in a northerly direction across Kramp Road directing surface runoff flows from the adjacent agricultural field. Aquatic habitat characterization of this reach (AHP-004) was completed on January 13, 2026 within the area ~50 m downstream of the Kramp Road culvert crossing structure.

Within this reach, the Tributary is characterized as an intermittent/ephemeral watercourse directing flows through a poorly defined channel within the heavily vegetated meadow area toward the wetland habitat further to the north. During winter 2026 surveys snowpack conditions obscured the culvert crossing structure dimensions. Near complete ice cover obscured the characterization of flow conditions within the Tributary, however gaps in ice coverage confirmed hydrologic connection and direction of surface water flows. Within the densely vegetated meadow feature riparian habitat

consisted of terrestrial grasses with traces of European Reed more dominant nearer the culvert crossing structure.

Due to the flooded and frozen conditions and local snowpack bankfull and wetted dimensions could not be accurately characterized. Substrates consisted primarily of sand and gravel with traces of accumulated organic detritus. No submerged aquatic vegetation was observed. Localized bank erosion suggests periodic high-flow conditions through this reach.

Surface water quality collected on January 13, 2026 (0915 hr; air temperature 0° C), recorded the following conditions:

- pH: 6.25
- Surface Water Temperature: 1° C
- Conductivity: 1.25 µs/cm (Total Dissolved Solids 545 ppt)
- Dissolved oxygen: 7.75 ppm (85.2 % saturation)

No defined channel or indication of periodic water flows were observed upstream of Kramp Road. No fish or other aquatic species were observed within this assessment reach.

4.5.5 Fish Community

No targeted surveys were undertaken to assess the fish community within the Subject property during the Winter 2026 field survey. The aquatic habitat assessment completed in January 2026 found that the Tributary of Hopewell Creek and the wetland features have the potential to provide seasonal habitat for fish species. However, the availability of habitat would be intermittent, depending on the availability of standing water within the wetlands and watercourse. The Stormwater Management Pond downstream of Greenhouse Road and lack of watercourse channel features between the Stormwater Management Facility and Hopewell Creek has the potential to serve as a barrier to upstream movement by fish. As such, only seasonal and indirect fish habitat is provided by the Tributary of Hopewell Creek, as well as the onsite wetland feature.

Based on available background information, no fish species are known from within the Study Area, with no SAR or SCC, or SAR habitat known from within the Study Area DFO Aquatic Species at Risk Mapping (2025).

5.0 Significance and Sensitivity

An analysis of the significance and sensitivity of the existing natural features within the subject lands was completed in order to identify those features and habitat that are sensitive to disturbance. This analysis is based on the rarity or significance of features and/or associated functions as well as the current policies, legislation, or planning related studies. Such features and functions identified as sensitive to disturbance are further identified as 'constraints' to development, prohibiting or constraining aspects of proposed development around or within them. The analysis is also used to identify 'opportunity' areas that have been previously disturbed or contain no natural features and where there may be potential for habitat rehabilitation or enhancement.

The assessment of significance and sensitivity will need to be updated once spring and summer 2026 surveys have been completed and, in this regard, the findings outlined below are preliminary in nature.

5.1 Wetlands

Wetlands are important for many reasons including collecting and storing surface water and groundwater and providing habitat for plants, wildlife and fish. Wetlands operate on a water balance, where the hydrologic character of the wetland is determined by the combination of water inflow/outflow, topography and groundwater conditions (Mitsch and Gosselink 1993). Wetlands receive water through precipitation, surface inflow, groundwater inflow, and lose water through evapotranspiration, surface and groundwater outflow.

All wetlands (PSW, non-PSW and unevaluated) and their associated areas of interference are regulated by the GRCA. GRCA policies state that development or interference within a wetland, or development within an area of interference will not be permitted, with some exceptions that require a permit (Government of Ontario 2024).

The wetland communities present on the subject lands include a large cattail-dominated marsh, willow thicket swamp and poplar swamp. These early to mid-successional communities exhibit relatively low plant species diversity. The species are common, occupy a wide range of soil moisture conditions and are tolerant of disturbance.

Totalling approximately 15.6 ha in size, these wetlands provide substantial flood attenuation capacity as they are situated within a sub-watershed associated with Hopewell Creek that ultimately directs surface flow to the Grand River. The wetlands currently have limited cover of riparian vegetation to improve water quality and ultimately the wetlands drain to a roadside ditch and a 700 m stretch of agricultural field which essentially negates any water quality improvement the marsh could provide relative to Hopewell Creek.

The function of the shallow marsh as wildlife habitat for 6 anuran species, turtles and marsh birds exemplifies the diversity of wildlife supported by the wetland. The shallow marsh portion of the large wetland is also considered confirmed SWH (see Section 5.3, Map 3). The large wetland is viewed as a significant and sensitive feature and the preservation of this condition should be a main consideration for the stormwater design and site water balance.

5.1.1 PSW Complexing Review

Both of the wetlands on site, as well as a small wetland immediately west of Greenhouse Road, are mapped as part of the Breslau Provincially Significant Wetland Complex (Map 1). This wetland complex includes other wetlands located along Hopewell Creek and to the south of the subject lands.

The wetlands within the Hopewell Creek floodplain are 650-700 m from the large cattail marsh on the subject lands and are separated by subdivision and row crop fields. The large swamps to the south of the subject lands are separated by 200-500 m of row crop and sod fields as well as residential and commercial lots. Within the subject property, the larger wetland is approximately 15 ha in size, while the smaller wetland is approximately 0.6 ha.

The Ontario Wetland Evaluation System underwent revisions in 2022 that have implications for existing wetland designations. The most notable changes focused on the methodology for complexing of units and the removal of species at risk consideration as part of the evaluation. As a living document, an existing PSW can be re-evaluated.

In consideration of the 2022 changes to the OWES, the designation of the subject land wetlands as PSW is no longer valid and these wetlands should be considered non-PSW. The reasoning for this change being:

- NRSI interprets the updated 2022 OWES guidance as not allowing for the complexing of wetland units with the potential exception of units in very close proximity and typically within a common natural feature. The previous OWES guidance had supported that wetland units within 750 m of one another and occurring within the same watershed could be complexed. Given the separation from the other wetland units to the west and south, the subject land wetlands should be removed from the complex and evaluated on their own. As much of the OWES scoring is based on a gradient relative to total wetland size (larger total wetland size scores substantially higher than a small wetland size for many components), the scoring potential of the subject wetlands on their own is therefore greatly reduced.
- With respect to the 0.6 ha wetland located in the agricultural field as well as the 0.3 ha wetland west of Greenhouse Road, OWES mapping standards typically require a minimum unit size of 2 ha unless the feature is significant in the local context (e.g. a fen or bog or supporting a notable species such as a regional rarity that occurs at no other location in the county). Although there is direct surface water connection between the large wetland and the wetland west of Greenhouse Road, the road corridor creates a well-defined separation between the two. Both the 0.6 ha and 0.3 ha wetlands are low quality mid-successional stands of Trembling Aspen and non-native Reed Canary Grass and do not represent notable features. Neither should be mapped as part of an OWES evaluation and neither is eligible for complexing with the large marsh feature.
- The determination of the existing PSW designation factored in species at risk habitat scoring which is no longer applicable to the OWES process. The designation of PSW is often the result of Special Features scoring which had previously included the habitat for species at risk. Under the revised OWES, provincially tracked species (such as Snapping Turtle) are still afforded points.

A fulsome re-evaluation of the wetland was not completed as part of this EIS; however, we are confident that the application of the updated OWES guidance results in the re-designation of the on-site wetlands as non-PSW. The larger wetland fulfills the criteria to be considered a locally significant wetland (Township of Woolwich 2025).

As a non-PSW that contains confirmed Significant Wildlife Habitat (turtle overwintering), and in the absence of species at risk habitat, the designation of this wetland as Core Environmental Feature in the Township Official Plan (2025) should be updated to Supporting Environmental Feature. Such features play an important role in maintaining the ecological functions provided by the Greenlands Network and the Official Plan states that they will be maintained, enhanced or restored.

5.2 Significant Woodlands

No significant woodlands are present within the subject lands. Treed features within the subject lands include two Poplar Mineral Deciduous Swamp (SWD4-5) features, both of which are approximately 0.6 ha in size and two Fresh-Moist Lowland Deciduous Forest (FOD7) features that are approximately 0.7 ha and 1.4 ha in size. None of these treed areas meet the provincial or regional criteria to be considered significant.

5.3 Significant Wildlife Habitat

Based on the background information review, desktop analysis, and field surveys completed to date, the study area includes both confirmed and candidate SWH.

5.3.1 Seasonal Concentration Areas

Wildlife seasonal concentration areas are defined as areas where animals occur in relatively high densities for all, or portions, or their life cycle (OMNR 2000). These areas are generally relatively small in size, particularly when compared to areas used by these species during other times of the year.

5.3.1.1 Turtle Wintering Area – Confirmed

Both Midland Painted Turtle and Snapping Turtle have been observed within the large marsh and on nearby roads. Given the quality of the shallow marsh habitat as overwintering habitat and in consideration of limited suitable habitat nearby, this SWH has been assumed to be present. It is likely that both species use the marsh for overwintering (as well as foraging and basking). The extent of this SWH type is shown

on Map 3. The function of this habitat could be affected by changes to hydrological inputs as a result of the development, in particular if the SWM design results in a deficit in surface water input reaching the wetland.

5.3.1.2 Bat Maternity Colony – Candidate

The potential presence of bat maternity colony habitat requires further evaluation in spring 2026. This SWH type may be present within areas of tree or shrub cover associated with the large wetland, all of which will ultimately be retained and afforded a buffer to enhance the function of the feature for potential use by bat species.

The residence in the far northeast, as well as landscape trees surrounding the residence, may provide suitable habitat for a maternity colony. A preliminary assessment of bat habitat trees was completed within the proposed grading limit of the subject lands during the tree inventory. Several potentially suitable bat cavity trees were identified along the residence driveway, as described in the TPP (NRSI 2026). Further assessment will determine the significance of this area as bat habitat and these findings will be outlined in an EIS addendum.

5.3.1.3 Reptile Hibernaculum – Candidate

The residence and old barn foundation in the far northeast of the subject lands may provide suitable snake hibernacula habitat. NRSI biologists will assess the suitability of features in this area during the early spring once snow has melted. Given the lack of supporting habitat such as meadow or wetland within several hundred metres of the buildings, this area is somewhat isolated and the presence of a hibernacula is low.

5.3.2 Specialized Wildlife Habitat

Specialized habitats include those that support wildlife species with highly specific habitat requirements, areas with exceptionally high species diversity, and/or areas that provide habitat that greatly enhances a species' chance of survival (OMNR 2000). The SWHTG indicates that most specialized habitats have not been formally identified or mapped by any agency (OMNR 2000).

5.3.2.1 Waterfowl Nesting Area – Candidate

The large marsh has small stands of mid-age Poplar trees adjacent that could be used by nesting waterfowl but these areas are <120 m wide, flanked by agricultural field and

the structure is sparse. It is very unlikely that the SWH criteria would be fulfilled for waterfowl nesting. The creation of riparian treed habitat within the wetland buffers could improve the potential for the feature to support waterfowl nesting in the future.

5.3.2.2 Turtle Nesting Areas – Candidate

The agricultural fields are silt-loam and do not constitute optimal substrate for turtle nesting. Gravel areas existing within the nearby greenhouse properties as well as the shoulders of Kramp Road, Greenhouse Road and Highway 7 all offer optimal nesting substrate. In order to reduce potential road mortality as a result of turtle nesting on shoulders of roads, enhancements such as the creation of nesting features within the wetland buffer has been identified as a habitat improvement measure.

5.3.3 Habitat for Species of Conservation Concern

Confirmed habitat for SCC may be considered Significant Wildlife Habitat (OMNR 2000). Based on background information collected 11 SCC were reported from the vicinity of the study area. Candidate habitat for four of these species (Barn Swallow, Eastern Wood-pewee, Snapping Turtle, Western Chorus Frog) was identified within the subject lands by comparing the results of vegetation community mapping to the habitat requirements for each of these species outlined in the SWHTG (OMNR 2000 Appendix G).

5.3.3.1 Terrestrial Crayfish – Candidate

The transitional areas of mesic soil surrounding the marsh may provide suitable habitat for terrestrial crayfish. To date, no crayfish chimneys have been observed during the marsh-focused surveys, but additional effort will be made in spring 2026 to verify the status of crayfish chimney SWH on the subject lands.

5.3.3.2 Special Concern and Rare Wildlife Species – Confirmed

To date, Snapping Turtle has been observed in the vicinity of the marsh and it is likely that this species uses the wetland for basking, foraging and overwintering. Snapping Turtle may nest along roadsides or potentially in agricultural fields, although the substrates within the subject lands are not ideal. This SWH for Snapping Turtle can be protected through the application of natural feature buffers and enhanced through naturalization and the creation of nesting features. Ultimately, the future improvement of the connection to Hopewell Creek, on the north side of Victoria Street, will be critical to

ensuring that turtles and other wildlife can move between the subject wetlands and those within the Hopewell Creek corridor.

Barn Swallow and Eastern Wood-pewee may utilize habitats within the subject lands; with the exception of the structures in the far northeast, that could be used by nesting Barn Swallow, the potential foraging and nesting habitats associated with the wetlands and adjacent woodlands will not be impacted by the development.

5.4 Habitat of Endangered and Threatened Species

The ESA prohibits killing, harming, harassing or capturing SAR a protects their habitats from damage and destruction. The PPS states that development and site alteration shall not be permitted in the habitat of endangered and threatened species, except in accordance with provincial and federal requirements (OMMAH 2024).

5.4.1 Candidate Habitat for Endangered and Threatened Species

The residence in the northeast may provide suitable roosting and maternity colony habitat for five of the seven bat species listed in Appendix I. The other two bat species may utilize the marsh or swamp thicket for foraging or roosting.

All of the bat species are listed as Endangered provincially (MECP 2024). As the residence was not assessed for bat habitat and no targeted bat acoustic surveys were completed, this feature constitutes candidate SAR bat habitat that requires assessment later in 2026 and the habitats are not depicted on Map 3. Since there will be no direct impacts to the large marsh and swamp thicket feature, and these habitats will continue to function in their current state with a natural feature buffer also provided, the candidate habitat for Hoary Bat and Eastern Red Bat will not be affected by the proposed development. By maintaining the feature water balance, the wetland form is not anticipated to change (i.e. shrub thickets will not become inundated and transition to marsh and conversely, the shallow water marsh will continue to function as such with good bat foraging habitat maintained). The proposed SWM pond located beside the wetland may enhance foraging opportunity for bats as well as aerial insectivore birds.

The SAR screening exercise, coupled with field surveys completed to date, did not identify any other potential SAR habitat within the study area.

5.5 Fish Habitat

Seasonal and indirect fish habitat is provided by the Tributary of Hopewell Creek and wetland habitat features within the subject lands. However, no fish habitat is known from within the subject lands, as this area is hydrologically isolated from the main branch of Hopewell Creek by the existing stormwater management pond on the west side of Greenhouse Road and the lack of downstream watercourse features. The *Fisheries Act* protects fish and fish habitat (as identified within the Act) up to the high-water mark.

5.6 Linkages

Linkages are continuous, often linear strips of the landscape which provide opportunities to connect natural features. They are important within the natural heritage system to direct wildlife movements and dispersal of otherwise isolated populations. The Woolwich Township OP (2025), Appendix II, Figure 4 identifies a conceptual wildlife linkage associated with the surface drainage that runs through the agricultural field on the north side of Victoria Street North. This recommended future corridor is approximately 700 m in length. In order to contribute to the conceptual corridor, any future improvement to Greenhouse Road and Victoria Street at the watercourse crossing locations should consider wildlife movement by way of this future linkage. Although not relevant to the Bisgould Lands development, the incorporation of ecopassages or other road ecology measures will protect and preserve the turtle population associated with the large wetland that is presently isolated from nearby natural areas. In general, the subject lands do not contain any existing linkages that would be negatively affected by the development. By affording a wetland buffer for the western block, a band of upland will be preserved that facilitates wildlife movement toward the SWM pond on the west side of Greenhouse Road. The value of this connectivity will not be realized until the larger connection to Hopewell Creek, through the area currently in row crop agriculture, is made in the future.

Within the local context of the subject lands, the smaller wetland on site is approximately 60 m from the larger wetland. Functionally the agricultural field is somewhat limiting for the dispersal of anurans or small mammals. The development concept proposes to locate the stormwater management block between these two wetlands with buffers afforded. This presents an opportunity for enhancing the natural linkage between these features. The implementation of wetland buffers will reduce the separation to

approximately 30 m and the naturalization around the stormwater pond and absence of roads, structures or lighting allows for improved passage of wildlife.

To the south of the subject lands, the large marsh is separated from a large swamp feature by a distance of approximately 200 m. Although the two features are situated in different catchments that direct surface water in different directions, any future potential for linkage creation would be beneficial to local wildlife populations. The proposed development will retain the wetland as it exists up to the north side of Kramp Road and an upland buffer along the east side of the wetland will improve the conditions for wildlife dispersal to the south, through what is currently sod field. This area is currently outside of the settlement area boundary and will likely remain as an agricultural field for the foreseeable future.

5.7 Summary of Natural Feature Constraints

Table 4 provides a summary of features identified as a constraint to development within the study area.

Table 4. Summary of Natural Feature Constraints

Natural Feature Constraint	Regulatory and Permitting Considerations	Project Considerations
Wetlands in Subject Lands	Ontario Regulation 41/24 (Government of Ontario 2024)	- Development and site alteration with the regulated wetlands are prohibited unless permitted by the GRCA - The two wetlands should be considered non-PSW based on updates to the OWES put forward by the Government of Ontario in 2022. - The larger wetland supports a variety of anurans, turtles and bird species. Both the larger and smaller wetland will be afforded a naturalized buffer. - The location of the SWM facility between the two wetlands presents an opportunity for improved natural connection between the smaller and larger wetland. - The proposed works within GRCA-regulated lands will require a permit.
Habitat of Endangered and Threatened Species	<i>Endangered Species Act, 2007</i> - Provincial Policy Statement (OMMAH 2024) - Region of Waterloo OP (2024) - Township of Woolwich OP (2022)	- Candidate habitat for SAR bats was identified within the subject lands. - Section 9 of the ESA prohibits activities that result in direct impacts to SAR such as killing, harming, harassing, etc. Section 10 of the ESA prohibits damage or destruction of habitat for SAR. - Development and site alteration shall not be permitted in the habitat of endangered and threatened species, except in accordance with provincial and federal requirements (OMMAH 2024). - The ESA is soon to be repealed and replaced with the Species Conservation Act which may change the definition of protected habitat for these bat species and the protections afforded. - Habitats with trees, shrubs or the residence may provide habitat for SAR bats.
Fish Habitat	<i>Federal Fisheries Act, 1985</i> - Provincial Policy Statement (OMMAH 2024) - Region of Waterloo OP (2024)	- Seasonal and indirect fish habitat is provided by the tributary and wetland habitat features. - The project may require a review by the DFO for if impacts to fish or fish habitat cannot be avoided. - Development and site alteration shall not be permitted within fish habitat except in accordance with provincial and federal requirements (OMMAH 2024, Region of Waterloo 2024).

6.0 Impact Analysis and Recommendations

6.1 Description of the Proposed Undertaking

The proposed development of the Bisgould Lands includes the construction of low-density residential blocks, stacked townhouse and mixed-use blocks as well as roads and servicing. A park block and SWM facility are proposed to the immediate east of the main wetland. The proposed road connections include Kramp Road and Greenhouse Road as well as an emergency access to Victoria Street North.

To the east of the large wetland, surface water generally flows in a northeast to southwest direction. The existing elevation in the northeast of the site is approximately 330 m.a.s.l. while the eastern edge of the large wetland is situated at approximately 325 m.a.s.l. Fill grading is proposed in the western portion of this field including a grade increase of approximately 5.5 to 6.0 m in the northwest (behind the nursery) and an increase of up to 3.0 m north of Kramp Road. The current height of land in the northeast will see a grade cut up to approximately 3.5 m to level this topographic rise to better allow servicing and development. The eastern and northern extents of the site will match grade with the adjacent parcels. In the western block, the grade in the central-north part of the block will increase up to 3.5 m to improve the buildable area outside of the natural feature buffer.

The details of the proposed undertaking are shown on Map 3 as well as the drawings prepared by Crozier & Associates and the Draft Plan prepared by GSP.

Direct impacts to natural communities will be limited to an area of meadow located off of Greenhouse Road totaling approximately 0.9 ha in size. A small number of landscape and hedgerow trees in the HR1 and HR3 are proposed for removal or may otherwise be harmed but retained. Trees within HR2 along with trees surrounding the residence will be removed in their entirety. The residence and outbuildings in the far northeast may provide roosting or nesting habitat for bat and bird species respectively and additional surveys in 2026 will determine the potential presence of SAR/SCC in this area.

6.2 Approach to Impact Analysis

Potential impacts arising from the proposed development are determined by comparing the details of the site grading and development concept with the characteristics of the existing natural features and their functions. Where the proposed development overlaps with natural features or their buffers, impacts may occur. A site grading plan and stormwater management plan have been prepared by Crozier & Associates and have been reviewed in the preparation of this EIS. NRSI has conveyed to the team that the form and function of the existing wetlands can be protected and enhanced by affording a 15 m buffer that is discussed in Section 6.6. The following is a description of the types of impacts that have been assessed as part of this EIS:

- Direct impacts to the natural features on the subject lands associated with disruption or displacement caused by the actual proposed 'footprint' of the development.
- Indirect impacts associated with construction activities and disturbance to wildlife and natural features.
- Induced impacts that can occur after construction has concluded, such as disturbance resulting from settlement or unauthorized trail creation within natural areas.

6.3 Direct Impacts and Mitigations

Two areas of direct impact to natural features are shown on Map 3. The proposed stacked townhouse block along Greenhouse Road would result in approximately 0.9 ha of meadow being removed (with approximately 0.7 ha of the existing meadow retained).

The second direct impact is the removal of some of the landscaping and fenceline trees, namely Hedgerow 2 and trees around the residence in the northeast and along the shared property line with Belgian Nursery. Impacts to property line trees would need to be discussed with the adjacent landowners, as outlined in the TPP (NRSI 2026). The removal of the residence and outbuildings may also constitute a direct impact if surveys in May-June 2026 confirm that any of these structures are being used by significant wildlife (bats, birds or snakes).

The development will retain the 0.6 ha poplar swamp located within the agricultural field with a buffer afforded and no direct impact proposed.

6.3.1 Grading and Vegetation/Tree Removal

Although the development will result in the removal of 0.9 ha of meadow along Greenhouse Road, the retention of 0.7 ha of this meadow as well as the creation of approximately 2 ha of meadow along the eastern edge of the wetland represents a net gain in cover of this community type. It is noted that the meadow has not been identified as a development constraint and has no formal protections applicable to it. The retained meadow will continue to stabilize soil and minimize erosion potential. For the post-development UNC-2 catchment (see grading plan Figure 4 provided by Crozier & Associates), the re-establishment of meadow within the unmanicured portion of this catchment will be complimentary to the 15 m buffer and will contribute to intercepting pollutants in runoff moving toward the wetland.

The trees proposed for removal include individual landscaping trees and short hedgerow features that do not provide any appreciable linkage function. NRSI has worked with the team to maximize tree retention to the extent possible. Notably, this includes the retention of trees on or near property lines which, in addition to wildlife habitat, also provide a privacy barrier for residents or visitors to the adjacent cemetery. Where property line tree removals are proposed, Thomasfield Homes will contact those landowners to discuss the matter. A total of 74 trees will require removal from the subject lands and areas adjacent to the proposed grading limit. A full summary of proposed mitigation and compensation measures for the removal of these trees is provided in the TPP (NRSI 2026).

All treed habitats and swamp thicket have been identified as candidate habitat for SAR bats as well as candidate bat maternity colony SWH and these require further evaluation in May 2026. The potential direct impacts to wildlife that may utilize trees, as well as appropriate mitigations, are discussed in Section 6.3.2.

Mitigation

- Erosion and Sediment Control (ESC) fencing will be erected prior to construction at the grading limit to prevent accidental encroachment or disruption of natural features and habitats that will be retained. An ESC plan should be prepared by a qualified engineer;
- Tree protection fencing should be installed around trees to be retained that are close to areas of grading. In some instances, the ESC fence may function as tree protection fence. Fencing must be installed and inspected by a Certified Arborist or environmental monitor prior to construction and must be maintained during construction;
- Any trees proposed for removal are to be compensated for as outlined in the Tree Preservation Plan. Details of compensation will be determined during the detailed design stage, but trees are expected to be planted along boulevards, within the park block, or in small areas of undeveloped land located beyond the natural feature buffers in the eastern development block; and,
- As an early successional stage preceding thicket and woodland formation in the buffer, meadow habitat should be established along the eastern edge of the large wetland and surrounding the smaller isolated wetland. Combined, this equates to approximately 2 ha of meadow which will effectively offset the removal of meadow habitat along Greenhouse Road. Although a meadow of similar composition is likely to establish on its own once field cultivation stops, the application of a native seed mixture should be considered as part of the buffer naturalization to increase species diversity and wildlife value.

6.3.2 Impacts to Wildlife and their Habitats

The majority of wildlife habitats to be removed from the subject lands are of species that are common and widespread on the landscape, and which are urban-adapted and disturbance-tolerant. This includes an area of approximately 0.9 ha of cultural meadow and various landscape and hedgerow trees largely associated with the residence in the northeast. The removal of a portion of the meadow and these trees will not affect local wildlife populations.

All confirmed or candidate SWH associated with the larger wetland, such as turtle overwintering or potential habitat for SCC birds such as Eastern Wood-pewee or bat maternity colony habitat, will be retained and afforded a buffer. No negative impacts to SWH are anticipated and overall conditions will improve through mitigation measures that will be implemented.

Vegetation clearing has the potential to directly impact bird breeding activity through damage and destruction of nests, eggs and young, or avoidance of the area by breeding adults. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act, 1994*.

Tree removals are required around the residence and if confirmed as suitable SAR habitat in spring 2026, this could have implications for SAR bat habitat that would require that the client engage the Ministry of Environment, Conservation and Parks.

Mitigation

- Vegetation removal should be completed between September 30th and April 1st (i.e. during late fall and winter). This timing avoids impacts to breeding birds, their nests and young (Government of Canada 2018). If vegetation removal is proposed to occur during the active nesting period, a qualified biologist should be consulted to determine if the area can be cleared for work to proceed using nest sweeps. Nest sweeps are typically valid for a period of 48 hours and are only effective in simple habitats where the absence of active nests can confidently be determined. Conducting vegetation removal during this period also avoids direct impacts to roosting bats and bat maternity colonies;
- To avoid the creation of nesting habitat for Bank Swallow (*Riparia riparia*), the stockpiling of tall mounds of soil should be avoided. If soil must be stockpiled on-site, the material should be regularly disturbed to deter nesting birds; and
- Although the development areas will be fenced off prior to the commencement of vegetation removal and generally inaccessible to wildlife, it is possible that mammals, snakes or turtles could enter the area. In the event that wildlife are encountered, work will stop temporarily to allow safe

passage to the adjacent natural area or off-site property. A biologist may be contacted if assistance is required to relocate wildlife.

6.3.3 Aquatic Features and Fish Habitat

Indirect and contributing Fish habitat has the potential to be present within the subject lands, which is primarily associated with the Tributary of Hopewell Creek and onsite wetland habitat features. However, the isolation of the subject lands from downstream resources by the stormwater management facility and lack of defined channel restricts upstream fish migration into the subject lands. Fish habitat within the Tributary of Hopewell Creek is primarily considered seasonal and indirect.

The proposed development concept is not anticipated to require any construction that has the potential for direct impact to fish or fish habitat within the site. The DFO provides additional measures to ensure the protection of fish and fish habitat features to ensure compliance with the *Fisheries Act*. If all the measures can be followed, then further review by the DFO is not required. However, if all measures cannot be implemented completely, then a Request for Review must be initiated from DFO. A high-level aquatic habitat assessment was carried out to determine the presence of fish habitat and to identify if proposed work has the potential to impact aquatic habitat in the study area. This assessment determined that the inclusion of Measures to Protect Fish and Fish Habitat outlined by DFO are feasible for inclusion in the final detailed design, and as such further review by the DFO is not anticipated.

It is recommended that the potential Fisheries Act implications be re-examined at the detailed design stage to ensure that necessary Measures to Protect Fish and Fish Habitat can be appropriately implemented.

Mitigation

- Any temporary stockpiled soil, construction debris, etc., should be stockpiled at least 30 m from the watercourse and should be properly contained;
- Removal of riparian vegetation should be avoided wherever possible. Following construction, any areas of exposed soil adjacent to the watercourse should be re-vegetated with appropriate native plant species;
- A comprehensive ESC plan should be developed by a qualified engineer and implemented during construction to ensure sediment does not enter the

watercourse during construction. Sediment fencing should be installed prior to the initiation of construction and maintained over the course of the project. ESC measures should be monitored by an environmental monitor on a regular basis (e.g. weekly) and following precipitation events to ensure it is functioning correctly. Details on monitoring are provided in Section 7.2.

- Develop an Emergency Spill Response Plan to be implemented in the event of a spill of deleterious substance;
- Follow the Pathways of Effects outlined by DFO to ensure appropriate mitigation measures are followed and implemented; and
- At the detailed design stage, the potential Fisheries Act implications should be re-examined to confirm that proposed avoidance and mitigation measures can be implemented appropriately and further review by the DFO through a Request for Review is not warranted.

6.4 Indirect Impacts and Mitigations

6.4.1 Changes to Wetland Hydrology and Water Quality

The physical, chemical, and ecological characteristics of wetlands are influenced directly by hydrology which also determines its ecological functions (Mitsch and Gosselink 2007). Negative impacts to wetland hydrology can be associated with infrastructure construction and development, which in turn can have a negative impact on the ecological function of a wetland. The site grading and construction as well as the operation of a SWM facility adjacent to the wetlands has potential to indirectly impact the wetland and the wildlife it supports. This is an issue particularly when there is a substantial increase in the proportion of impervious cover such as paved surfaces and roofs in the surface water and groundwater catchment of the wetland (Hicks and Larson 1997; Reinelt and Taylor 2001). Alteration to the size of the catchment area draining to a wetland due to land grading activities or stormwater management system design also has the potential to significantly change the water balance (TRCA 2017).

The term hydroperiod is used to refer to the pattern of water level change within a wetland over time, both above and below ground, and is a measure of the net sum of interaction between the different water balance components (TRCA 2017). The hydroperiod can vary in duration, seasonal timing, and between inputs and outputs of surface and groundwater.

Through surveys completed to date, the wetland is comprised of a relatively low diversity of plant species tolerant of hydrologic fluctuation and a high diversity of wildlife that includes 6 anuran species, 2 turtle species and marsh breeding birds.

A substantial increase or decrease in surface water quantity directed to the wetland would alter the existing vegetation communities and the current wildlife habitat function. Changes to water quality within the wetland also have potential to affect wildlife; in particular, increases in salt or petrochemicals would make the shallow marsh less suitable for anuran egg mass development and in turn foraging habitat for some marsh birds would be impacted.

With respect to flood attenuation, unmitigated surface water runoff to the wetland would decrease the capacity of the feature to hold and attenuate storm water during melt and significant precipitation events.

The SWM strategy prepared by Crozier & Associates (2026) aims to match the pre- and post-development catchment areas and runoff volumes in a manner that preserves the function of the wetland communities and their utility for attenuating stormwater. The pre- and post-development peak flows to the large wetland, are summarized in Table 5.

Table 5. Peak Flow Rates to Large Wetland

Storm Event	Pre-development (m³/s)	Post-development (m³/s)
12.5 mm	0.860	0.804
25 mm	2.161	2.049
2y	2.801	2.694
5y	3.987	3.868
10y	5.186	5.007
25y	6.347	6.065
50y	7.539	7.138
100y	8.767	8.233

Western Block

In the western block, located along Greenhouse Road, the existing catchment of 1.15 ha directs surface water overland in a northeast direction into the large wetland. The post-development grading will continue to direct all surface water to the wetland via two catchments: the developed area and an area of lawn, ditches and meadow around the periphery. The main catchment will collect runoff across the developed portion of the

block and direct it east to a holding tank. This SWM design is standalone from the eastern block and will have a volume capacity of at least 371 m³ to meet pre-development peak flow rates through the use of an underground SWM tank, LID features and surface ponding (Crozier & Associates 2026). The holding tank will include an oil and grit separator to ensure that water quality is maintained and the tank design and sediment trap allows suspended sediments to settle-out.

A smaller uncontrolled catchment which includes the roadside ditch, rear yard swales and the existing Union Gas compressor station directs runoff to the north and east into the wetland across a vegetated area that will continue to promote infiltration and filtering of runoff in the post-development phase.

Given that the pre- and post-development catchment areas and runoff volumes are essentially the same in the western block, and the tank structure will intercept oils and sediment in stormwater prior to outlet, the grading and proposed SWM approach in the western block will not have a negative impact on the wetland community or its function to receive and store clean stormwater.

Eastern Block

The eastern portion of the subject lands includes a large catchment of 22.81 ha that directs surface water southwest into the smaller and larger wetland features. A relatively small 1.23 ha catchment in the far northeast directs flow to the northeast into the ditch of Victoria Street and ultimately to the wetland on the east side of the cemetery.

The post-development grading and SWM design propose several changes:

- Fill grading in the northeast will redirect the 1.23 ha pre-development catchment to flow southwest toward the SWM pond that outlets to the larger wetland. Under both pre-development and post-development grading scenarios, the surface water in this catchment ultimately reaches Hopewell Creek. The existing catchment that flows northeast is part of a much larger catchment of approximately 80 ha that contributes to the hydrology of a White Cedar (*Thuja occidentalis*) swamp that outlets to Hopewell Creek approximately 1 km north of the subject lands. Under post-development grading, this catchment would be re-

directed to the on-site SWM facility and outletting to the large wetland within the subject lands. The potential impact on the existing overall catchment size directing flow to the northeast (1.23 ha of 80 ha representing just over 1%) and the composition of the White Cedar swamp to the north will be negligible. Under the existing drainage, the 1.23 ha of on-site catchment flows east for almost 350 m in the ditch on the south side of Victoria Street before reaching the tributary and it is expected that during the growing season, infiltration and evapotranspiration would substantially reduce the volume of water reaching the creek over this distance. For the large cattail-dominated marsh within the subject lands, the vegetation is tolerant of a slight increase in hydrological input. The SWM facility capacity and outlet design are intended to replicate pre-development inputs and a major change in hydrology will not occur. Measuring approximately 15 ha in size, the dispersal of additional stormwater volume across such a large area would not result in a notable increase in water depth or change in the vegetation community composition. As a palustrine feature, the invert elevation of the outlet culvert beneath Greenhouse Road dictates the water holding capacity and the depth of standing water within the feature will not increase as a result of the 1.23 ha addition to the catchment and the associated increase in surface water runoff.

- Under pre-development conditions, the smaller wetland located in the agricultural field, received surface water from approximately 5-7 ha of the larger 22.81 ha catchment. Currently, this feature outlets at its western extent to an intermittent flow path through the field toward the larger wetland. The proposed grading will result in a reduced direct catchment area for this wetland (1.31 ha) which will be bounded by Wambold Street to the north and the SWM pond to the south. Without mitigation, the catchment area will be much smaller and the feature will no longer outlet at the west end as a result of the SWM berm. The feature is predominantly Trembling Aspen with a shrub layer of non-native Glossy Buckthorn and areas of non-native Reed Canary Grass groundcover. These species are very tolerant of hydrological change and can occupy a wide range of soil moisture conditions ranging from mesic to seasonally inundated. Water table elevation in this area is relatively low and the hydrology of the wetland would not have an appreciable influence from groundwater, relying

solely on surface water input. The proposed alteration in drainage will reduce surface water input that would likely lead to a drier condition within this smaller wetland. Mitigation for this potential impact is described below. The proposed development plan identifies a buffer to this feature and the larger wetland and the naturalization of these buffer areas, along with the natural cover surrounding the SWM facility will improve the connectivity of this currently isolated feature to the larger wetland.

- Under post-development conditions, the peak flow rates to the large wetland (Table 5) are generally the same under post-development conditions (Crozier 2026). The majority of the eastern block runoff (22.66 ha) will be directed to the SWM pond to regulate runoff and ensure that sediment and pollutants are intercepted before the stormwater water reaches the wetland. The pond will have a volume capacity of 15,858 m³ to attenuate the 100-year storm event. The catchments identified on the Crozier drawings as “UNC-1” (a 1.00 ha park block in the south) and “POST-2” (a 0.36 ha area associated with a cul-de-sac in the northwest) will not direct runoff to the SWM, rather the runoff will move uncontrolled across vegetated lands (lawn and meadow/wetland buffer) and ultimately to the large wetland. Since the water in these catchments will collect on roof and landscaped areas, which are considered as clean runoff that do not require quality treatment, no water quality controls are proposed for these catchments (Crozier & Associates 2026).
- The SWM pond will concentrate the outlet of stormwater, whereas the pre-development sheet flow was widely dispersed across approximately 1 km of the wetland edge. The large wetland is already inundated and lacks complex microtopography meaning that stormwater input at a more concentrated point location will rapidly disperse across the uniform surface of cattails in standing water.

6.4.1.1 Site Water Balance

To understand the potential impact on the wetland communities, a site water balance assessment has been completed by Crozier & Associates (2026). In review of the SWM

data, NRSI has utilized a framework for assessing impacts developed by the Toronto Region Conservation Authority (TRCA 2017). This framework includes 4 steps:

Step 1. Determine which retained wetland(s) may be impacted by the proposal.

Step 2. Determine the magnitude of potential hydrological change.

Step 3. Determine the sensitivity of the wetland and its associated flora and fauna to hydrological change.

Step 4. Integrate information from step 1, 2, and 3 to assign a level of risk to the proposal.

As a portion of natural heritage field surveys have yet to be completed (vegetation, breeding birds and wetland boundary confirmation), the conclusions outlined below are subject to further study. Portions of the 4-step process can be commented on at a high-level. A fulsome assessment can be completed once surveys are complete and this will be included in the addendum EIS.

Step 1

The development has the potential to impact the larger and smaller wetlands within the subject property as well as a small marsh directly north of the property (on the Belgian Nursery property) and west of Greenhouse Road (part of the Hopewell Creek subdivision). A small catchment alteration in the northeast has the potential to affect an off-site wetland to the north of Victoria Street.

Step 2

In review of the water balance details provided by Crozier & Associates, the western block pre-development catchment is 1.5 ha in area which includes 1.15 ha of the catchment on the property with no impervious surfaces and 10% impervious cover off of the property. This catchment area remains the same size post-development. Under the post-development scenario, the impervious surface area of the mixed-use block increases to 80%. The SWM design prepared by Crozier & Associates (2026) notes “Both the major and minor flows from this catchment are conveyed into a stormwater management tank and OGS, which provide quantity and 80% TSS quality control before discharging into Greenhouse Marsh”. The uncontrolled catchment surrounding the development, which will be mostly landscaped, becomes 3% impervious.

In the eastern block, the pre-development catchment for the large wetland totals 22.81 ha in area (4% impervious) and this will increase to 24.02 ha post-development with the far northeast of the site now draining toward the large wetland and the SWM pond occupying a portion of the pre-development catchment. There will be an increase in impervious surface area of approximately 74% within the largest post-development catchment (17.86 ha) while the smaller developed catchments, POST-2 and POST-3, will become 80% and 75% impervious, respectively.

The pre-development annual infiltration volume will decrease from under the post-development scenario. The projected annual infiltration deficit of 25,500 m³ can be reduced through mitigation that includes LID measures finalized at detailed design that will be applied to an area of 101,300 m² of impervious surfaces.

Step 3

Characterization of the wetlands is incomplete and requires additional data collection in spring-summer 2026. In review of the TRCA framework, available data provides a partial indication of the sensitivity of the existing wetlands and the flora and fauna they support.

- The MAS2-1 shallow marsh, SWT2-2 willow thicket swamp and SWD4-5 poplar swamp are all considered to have medium sensitivity to hydrological change and are tolerant of slight change. The MAM2-2, dominated by Reed Canary Grass has low sensitivity.
- Broad-leaved Cattail and Pussy Willow, both of which are common in the shallow marsh and swamp thicket, respectively, have low sensitivity to hydrological change. The limited plant list limits this portion of the assessment.
- Two high sensitivity bird species, Pied-billed Grebe and American Bittern have been documented in the shallow marsh as well as Sora, a medium sensitivity species. A total of 7 low sensitivity bird species have also been recorded during the marsh bird surveys.
- 6 herpetofauna species with high sensitivity to hydrological change have been documented including Snapping Turtle, Midland Painted Turtle, Gray Treefrog, Wood Frog, Spring Peeper and Northern Leopard Frog. Both Green Frog and American Toad are considered to have medium sensitivity to change.

Through preliminary consideration of the medium to low sensitivity habitats supporting a number of high and medium sensitivity wildlife species, it is likely that the larger wetland will be considered to have medium to high sensitivity to hydrological change while the smaller wetland (a medium sensitivity community type but without any associated wildlife), will likely be low sensitivity.

Step 4

As additional surveys in spring and summer 2026 will improve our understanding of the communities within the subject lands and their function to support wildlife, a fulsome assessment of the potential impacts to site water balance must be completed once this data is available.

Mitigation

- The proposed site grading does not result in a substantial increase or decrease in the cumulative size of the western or eastern catchments which helps to balance the pre- and post-development water budget for the large wetland.
- The SWM facility will utilize a wet pond that includes a permanent pool and extended detention volumes. The stormwater storage capacity is of sufficient volume to attenuate post-development peak flow rates to levels that reflect pre-development rates, particularly in the 2-year, 5-year and 10-year storm events (Crozier & Associates 2026).
- In order to address the infiltration deficit, high-level mitigation strategy focuses on the implementation of LID designs to be outlined in greater detail at the detailed design stage. Approximately 30% of the of the low-density residential blocks and 100% of the mixed-use building and townhouse blocks can contribute clean runoff from rooftops. The implementation of LID for this runoff, can reduce the infiltration deficit to 12% (Crozier & Associates 2026).
- Within the SWM feature, a reverse sloped outlet pipe is proposed and this will encourage the controlled discharge of cooler water being drawn from a deep pool near the outlet of the pond. The discharge of cooler water to the wetland will help to regulate water temperature but is not anticipated to have any appreciable impact, positive or negative, on the function of the wetland as wildlife habitat.
- In order to ensure that the smaller wetland continues to receive adequate surface water to maintain the tolerant plant species (dominated by Trembling Aspen and

Reed Canary Grass), a pipe/weir structure is proposed as part of the SWM berm to allow water to flow into the small wetland during precipitation events. The pipe will be located near the western end of the pond to allow suspended sediments to settle before reaching the pipe. The elevation of the pipe/weir will be determined by Crozier & Associates to ensure that the small wetland does not inundate, and to maintain that the larger wetland still receives the bulk of the outflow from the SWM facility. The design of this conceptual feature has not been included on the SWM drawings. The team will work with GRCA to develop an approach that maintains the flood attenuation capacity of this smaller wetland and preserves the poplar swamp structure.

- For the SWM facility, the quality of discharged water will be regulated by a forebay and detention pond design that will remove suspended solids. The periodic clean-out of the SWM pond will ensure that the feature continues to have adequate capacity and functions as intended.
- For the SWM tank feature within the western block, an oil and grit separator installed down gradient of the tank will ensure that water discharged to the wetland is of acceptable quality.
- Although water leaving the SWM facility is anticipated to rapidly disperse throughout the marsh due to the permanent standing water and level topography, in order to dissipate energy and point source erosion from conveyed flows, a riprap-lined outlet will be constructed to dissipate energy and allow outflow from the pond to distribute beyond this feature within a naturalized buffer and ultimately entering the wetland.
- The SWM strategy proposes rear yard infiltration trenches throughout the subdivision, where possible. Based on spring surveys of the wetland between 2012-2025, it does not appear that the wetland receives groundwater baseflow as the water table elevation is well below the elevation of the wetlands within the study area. No seepage indicator species or iron-staining has been observed. Still, the promotion of groundwater infiltration on site is viewed as an improvement over the condition of uncontrolled runoff that currently occurs across the agricultural field. The subwatershed study identifies that “Maintaining upstream groundwater recharge and discharge areas, and protecting riparian wetlands, will help mitigate potential impacts of future downstream development” (GRCA 2014). The promotion of infiltration on the subject lands can contribute to

the baseflow of Hopewell Creek located 750 m to the west. Historically, natural vegetation cover and microtopography would have facilitated infiltration. From a natural heritage perspective, decreased surface water input to the wetland on account of infiltration intercepting a portion of the site runoff is not considered to be a negative impact but an overall benefit. The implementation of infiltration LID is a beneficial mitigation for many areas of the site with low groundwater elevation and where grading does not present a constraint.

- The planting of the wetland buffers with trees and shrubs and the naturalization of the SWM pond periphery will improve the connectivity of the smaller wetland with the larger wetland. The subwatershed study notes that “Degraded riparian zones should ... be restored in order to provide proper riparian form and function to aid in stream protection and allow for natural stream processes” (GRCA 2014). The agricultural field on the east side of the large wetland represents a degraded riparian area that can be stewarded to a functional buffer that contributes to improved conditions in this sub-watershed of Hopewell Creek.
- It is noted that all surface water within the subject lands ultimately flows across 700 m of sloping row crop field on the north side of Victoria Street which undoubtedly contributes sediment, phosphorus and nitrogen to Hopewell Creek. This watershed stressor limits the benefits that the Bisgould Lands site can contribute to improving surface water quality in Hopewell Creek. The establishment of riparian habitat and water quality within the subject lands should be viewed as a long-term contribution to the length of the tributary that will likely be restored and enhanced north of Victoria Street should future development occur on that parcel.

6.4.2 Disturbance to Adjacent Natural Features and Wildlife Habitats

Vegetation clearing and other construction activities have the potential to inadvertently destroy, damage and degrade existing vegetation along the construction limits, unless the construction limits are clearly demarcated in the field. For example, construction activities can cause scarring and decreased health of adjacent trees whose branches or root systems have been damaged by machinery or affected by construction-related dust and sedimentation. Damage to trees and other vegetation can also be caused by the compaction of soils within the tree rooting zones along the edges of the proposed construction area.

During construction activities such as vegetation clearing and grubbing, dust can potentially result in changes to vegetation due to increased heat absorption and decreased transpiration and immediate visual impact. Wildlife can also be disturbed and may avoid the area as a result of noise or artificial lighting associated with construction activities.

Mitigation

- Ecological impacts during construction can be limited by clearly demarcating construction limits in the field through the use of ESC or tree protection fencing. All fencing should be installed prior to site alteration and the initiation of construction activities, and should be inspected by a qualified arborist or environmental monitor;
- A construction setback of 15 m from the larger and smaller wetlands should be demarcated with heavy duty sediment fence;
- Where trees are located along the natural feature edges to be retained, tree protection fencing should be installed at least 1 m from the dripline, where possible, to adequately protect the rootzone from soil compaction and other disturbance;
- Dust related impacts should be mitigated by dampening areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced;
- Construction activities should be restricted to between 7:00 am and 7:00 pm to reduce noise impacts to nocturnal wildlife; and
- Any lighting equipment associated with construction activities should be turned off following the cessation of daily construction activities, or at least turned away from the adjacent natural features to prevent 'lightwash' of these areas.
- Permanent lighting including building fixtures and light standards along the boulevard should use directional lighting to the extent possible to limit the casting of light into the adjacent wetland.

6.4.3 Sediment and Erosion

During construction, areas of bare soil will be exposed which have the potential to erode during precipitation events and impact adjacent natural features including wetland and riparian habitat. In the event of a heavy rain, sediment laden runoff can enter adjacent natural areas by way of overland flow. In order to protect on-site and off-site natural features from potential impacts due to sediment, an ESC plan must be developed and implemented prior to any construction activities on the site and maintained over the course of construction until bare soils have been revegetated.

Based on the sloping grade in the eastern portion of the subject lands, the potential for erosion on the site is generally considered to be moderate. The SWM facility is proposed to utilize up to 5:1 slopes which will require adequate ESC and timely re-vegetation to prevent erosion impacts to the adjacent natural features. For the block along Greenhouse Road, the potential for erosion is relatively low.

Mitigation

- Preparation and implementation of an ESC plan by a qualified engineer prior to the initiation of any construction activities within the subject lands;
- All disturbed areas will be stabilized and revegetated as quickly as possible;
- Specific to the natural feature buffer area in the eastern field, upon harvesting the final row crop, the crop stubble and chaff should be left in-situ and the field should not be cultivated;
- ESC Inspections will be completed weekly or after an event greater than 15 mm during a 24 hour period or ≥ 5 mm/hr with at least 10 mm received; and
- Slopes greater than 5:1 must be stabilized as soon as possible by applying a fast-establishing seed mixture. Encircling a stockpile with keyed-in sediment fence should also be considered where erosion potential is high.

6.5 Induced Impacts

Induced impacts are described as those that are not directly related to the development activities but rather arise from the use of the natural areas as a result of settlement and use of the development.

Potential induced impacts include access to the wetland by residents or pets and the dumping of yard waste that may include invasive species. Induced impacts on the wetland are not anticipated as the feature is essentially impassable and bordered by dense thicket in many areas.

Mitigation

- The establishment of plantings in the buffer areas will increase woody vegetation cover that will deter entry.
- Some areas where residential blocks abut the wetland buffer will have a grade change that acts to separate the manicured property from the natural area and permanent rear lot fencing may also be considered in some areas.

6.6 Natural Feature Buffers

In order to protect and enhance the form and function of the natural features on site, a 15 m buffer to the non-PSW wetlands is appropriate. The buffer extent is entirely driven by the wetland boundary. The full extent of buffer afforded in the eastern block currently exists as row crop field that is cultivated to the wetland edges and the implementation of buffers represents a substantial gain in natural cover.

The most sensitive portion of the wetland is the central shallow marsh which is separated from the field edge by swaths of Reed Canary Grass and willow thickets measuring between 10-90 m in width. The Reed Canary Grass Marsh is considered a low sensitivity wetland community (TRCA 2017). Although these areas are also wetland communities, both are tolerant of edge disturbance and provide functional buffering of the shallow marsh where the sensitive wildlife species are concentrated.

All treed areas adjacent to the agricultural field have a history of annual field cultivation that has effectively root pruned the Trembling Aspen, and a 15 m buffer will improve the growing conditions for these stands of trees. The bulk of the larger wetland periphery includes a dense thicket of willow and dogwood shrubs that inhibits access. Once field cultivation stops, it is anticipated that, in addition to planted native stock, the area will colonize with poplar, willow and dogwood through seed dispersal into the buffer. The planting of species other than Trembling Aspen and willows within the buffer will contribute to increased species diversity as this isolated feature does not currently have

the opportunity for a diversity of tree and shrub seed to reach the site. Due to the presence of Common Buckthorn and Glossy Buckthorn, both of which could spread to the buffer, pre-planting management of mature buckthorn shrubs along the outer edge of the natural feature is proposed in order to suppress seed production and ensure the successful establishment of a diverse native buffer area.

A 15 m buffer will enhance the filtering of surface runoff. The subwatershed study (GRCA 2014) identified that elevated nutrient concentrations in the Hopewell Creek watershed are a stressor on water quality and the addition of a 15 m buffer on the east side of the large wetland will make a small contribution to improving water quality. A naturalized buffer will also provide an improved visual screen between existing and proposed adjacent development and the wetland once trees become established.

7.0 Recommendations

It is recommended that the additional natural heritage surveys identified in the TOR be completed in spring and summer 2026 to ensure that the characterization of the natural features is accurate and features are afforded sufficient mitigation measures. An EIS addendum should be prepared based on the completion of additional surveys and the report submitted to the reviewing agencies. Once full characterization of the site has been completed, the EIS addendum can speak to the site water balance.

Under the current understanding of the study area and the sensitivity of the natural features, the following recommendations are intended to maintain and enhance the quality of the habitats within the subject lands.

7.1 Enhancements

The following recommendations for enhancement include the naturalization of the wetland buffer areas as well as management of invasive shrub species. These tasks will ultimately improve the quality and resiliency of the wetlands and riparian areas.

- The wetland buffers include the eastern portion of the Greenhouse Road block as well as the entire eastern edge of the large wetland and the wetland located within the agricultural field. These buffer areas should be naturalized through the planting of site-appropriate native trees and shrubs. It is noted that the periphery of the wetland already includes dense stands of willows and dogwoods that will blend with planted material within several years. A Restoration Planting Plan should be developed to demonstrate the species, quantities and sizing of material to be planted within buffer blocks. Species should generally be tolerant of mesic soil conditions and be native to Waterloo Region. Recommended tree species include Red Maple (*A. rubrum*), Black Cherry (*Prunus serotina*), Trembling Aspen, White Cedar and White Pine (*Pinus strobus*). Shrub species may include Gray Dogwood (*Cornus racemosa*), Nannyberry (*Viburnum lentago*) and Staghorn Sumac (*Rhus typhina*). Other hardy species may be included in the Planting Plan. Trees should be planted singly or in sparse groupings while shrubs should be planted in groupings of like species.

- For the two buffer areas in the eastern block, a nurse crop of Annual Oats (*Avena sativa*), Pearl Millet (*Pennisetum glaucum*) or Annual Rye (*Lolium multiflorum*) should be applied to ensure adequate herbaceous cover and to suppress agricultural weeds in the early stage of buffer naturalization. Any of these species, or a combination, should be worked into the soil at a rate of 25 kg/ha after the last row crop is harvested. The buffer portions of the row crop field should not be ploughed after the last crop is harvested to minimize weeds and prevent erosion.
- To enhance the existing natural features, and to ensure that the buffer areas are not taken over by invasive shrubs, Common Buckthorn and Glossy Buckthorn should be managed along the edges of the natural features. These shrubs should be managed using herbicide applied by a licensed herbicide applicator. All mature (seed-bearing) plants should be treated with a basal bark application of Garlon RTU applied between June and November. A single application with the intention of removing the seed-producing plants, is recommended. All treated shrubs will remain in-situ to prevent the spread of seeds and to contribute to woody material accumulation on the ground. Following the herbicide treatment, a brief memorandum should be prepared to document that the work was completed including the contractor name, application date and areas covered. This correspondence should be provided to the Township upon request.
- Along the eastern buffer of the large wetland, 2-3 turtle nesting features should be created. Each mound of well-drained granular material will measure approximately 10 m² in size and will be located between the park block and to the south of the Belgian Nursery property (i.e. removed from the vicinity of Greenhouse Road). Thomasfield Homes installed similar features for the Hopewell Creek subdivision to the west and the creation of this habitat will alleviate road mortality and nest damage that may be occurring along Victoria Street and Greenhouse Road. NRSI has worked with Thomasfield on the installation of nesting features and can coordinate this as a component of the buffer naturalization.

7.2 Monitoring

Pre-, during-, and post-construction monitoring is recommended as a means to ensure that adjacent natural features are not impacted throughout all stages of the proposed development. The recommended monitoring components are described below.

7.2.1 Pre-Construction

Prior to any construction activities on-site, including vegetation clearing and grading, on-site inspections of the following should be undertaken to ensure proper installation:

- Sediment and erosion control measures (e.g., silt fencing, straw bales) as confirmed by an environmental monitor or qualified biologist; and
- Tree protection measures, including proper installation of fencing as confirmed by a Certified Arborist or environmental monitor.

7.2.2 During Construction

Construction monitoring is the responsibility of the proponent and is tied to the specific undertaking. Generally, construction monitoring must occur to ensure compliance with the conditions of various permits:

- Periodic monitoring of the above measures to ensure maintenance and effectiveness, monitoring of ESC measures is recommended to occur on a weekly basis, or following a significant rainfall event (i.e., ≥ 15 mm in a 24 hour period or ≥ 5 mm/hr with at least 10 mm received) and following thaw events in the winter months;
- Pruning of any limbs or roots (of trees to be retained) damaged during construction to be completed by a Certified Arborist;
- Fueling of machinery to be undertaken at designated location away from the wetlands and watercourse; and
- Storage of machinery and material, fill, etc. in designated areas away from natural features.

7.2.3 Post-Construction

In order to ensure adequate establishment of the buffer plantings, an inspection and sign-off should occur at the end of the 2-year warranty period. The tender for installation

of the naturalization plantings should stipulate a survival rate of 70% across all tree and shrub species following two growing seasons with the requirement that material be replaced if this threshold is not met at the end of the 2-year period. All material used to stabilize caliper tree plantings should be removed upon final inspection to prevent girdling of tree stems.

The details of the proposed monitoring plan will be refined during the detailed design stage in conjunction with the Township and the GRCA.

8.0 Conclusion

NRSI was retained by Thomasfield Homes to complete an EIS for the proposed development of a subdivision located at 2699 Victoria Street North in Breslau, Ontario. This report provides a summary of the natural features within the study area and provides an analysis of impacts based on the proposed grading and development concept.

The subject lands include a large field currently used for row crop agriculture, two wetlands, a small area of meadow and a residence. Although the wetland is somewhat isolated with intermittent inflow and outflow, fish habitat is present within a poorly defined channel that bisects the large marsh feature.

The proposed development minimizes direct impacts to natural features with a small area of meadow to be removed as well as the demolition of a residence and outbuildings and the removal of individual landscape trees and a 150 m long hedgerow next to the residence. The assessment of impacts focuses largely on the proposed stormwater facility and ensuring that grading and SWM design maintain the appropriate water balance. Natural feature buffers of 15 m will protect the form and function of the wetland and present a net gain in natural cover of approximately 1.4 ha. Mitigation measures include the installation of ESC/tree protection fence, adherence to timing windows and the naturalization of the buffer areas.

This report provides recommendations to promote the establishment of functional natural feature buffers and the enhancement of the existing wetland and upland habitats. Through the implementation of the identified mitigation measures and monitoring, the impacts of the development on the natural features can be minimized with overall benefit to the wetland features.

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MAPS



Path: X:\3681_BisgouldLandsEIS\3681_BisgouldLandsEIS.aprx (NRSI_3681_Map1_StudyArea_5K)

Map 1

Bisgould Lands EIS

Study Area

Legend

- Study Area (120m)
- Subject Property
- Railway
- Permanent Watercourse
- Intermittent Watercourse
- Waterbody
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland
- Wetland (GRCA)
- Wooded Area
- Regulation Limit (GRCA)

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Project: 3681 Date: January 5, 2026	NAD83(CSR)Sv7 - UTM Zone 17 Size: 11x17" 1:5,000
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Map 2

Bisgould Lands EIS

Existing Conditions and Monitoring Stations

Legend

Study Area (120m)

Subject Property

Aquatic Habitat Point (AHP)

Breeding Bird Station (BMB)

Calling Anuran Station (ANR)

Marsh Breeding Bird Station (MBB)

Railway

Permanent Watercourse

Intermittent Watercourse

Waterbody

Invasive Species
European Reed

Ecological Land Classification (ELC)

(Ag) Agriculture

(CUM1-1) Dry - Moist Old Field Meadow Type

(FOD7) Fresh - Moist Lowland Deciduous Forest Ecosite

(H) Hedgerow

(MAM2-2) Reed-canary Grass Mineral Meadow Marsh Type

(MAS2-1) Cattail Mineral Shallow Marsh Type

(SWD4-5) Poplar Mineral Deciduous Swamp Type

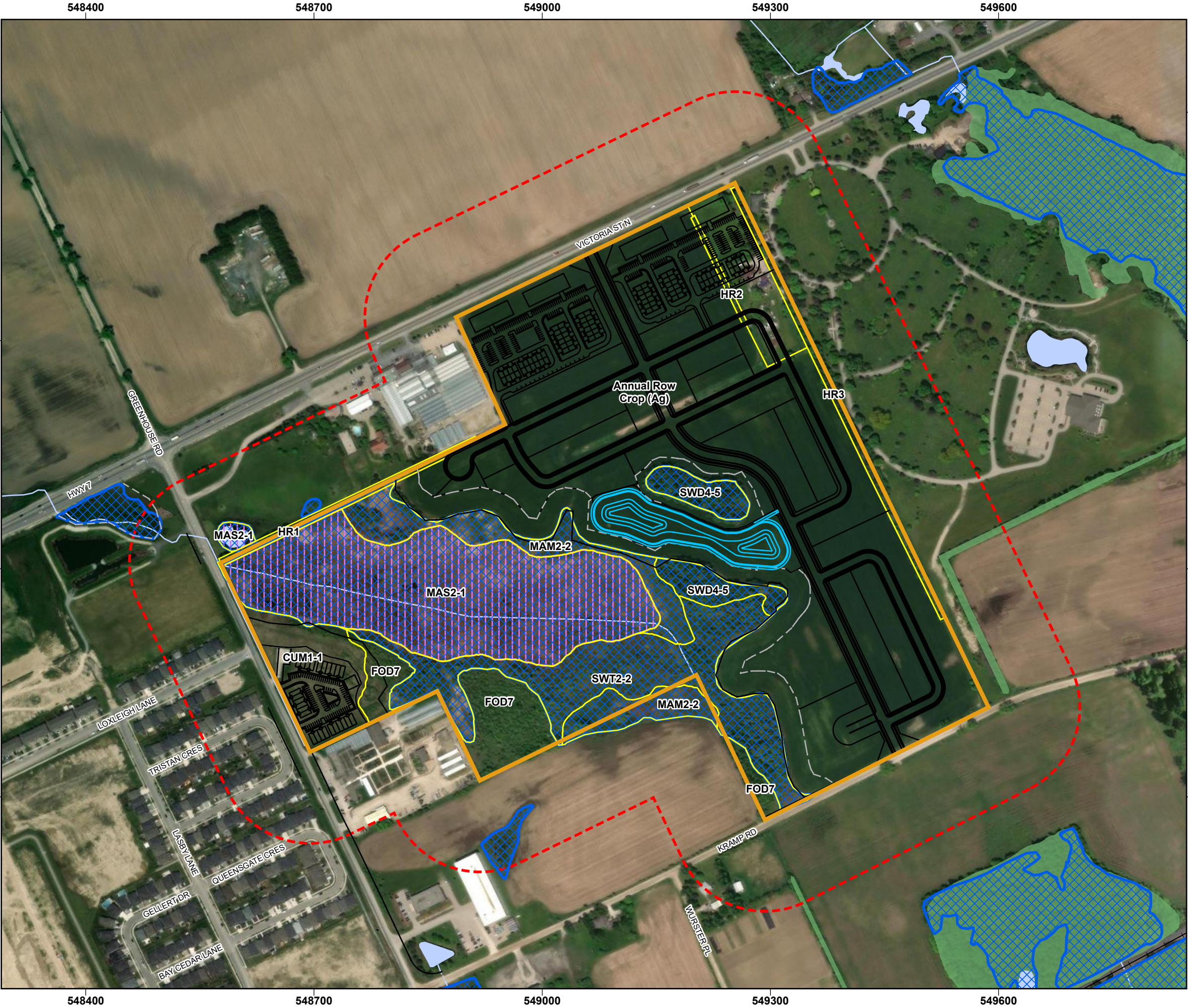
(SWT2-2) Willow Mineral Thicket Swamp Type

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Map 3

Bisgould Lands EIS

Opportunities and Constraints

Legend

- Study Area (120m)
- Subject Property
- Railway
- Permanent Watercourse
- Intermittent Watercourse
- Proposed SWM Pond
- Proposed Development
- Development Limit
- Confirmed Significant Wildlife Habitat: Turtle Overwintering Area
- Waterbody
- Wetland (GRCA)
- Wooded Area

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Project: 3681 Date: January 21, 2026	NAD83(CSRS)v7 - UTM Zone 17 Size: 11x17" 1:5,000
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APPENDIX I

Species at Risk and Species of Conservation Concern Screening Table

Species at Risk and Species of Special Concern Screening Table

Common Name	Scientific Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Comments
Vascular Plants												
Butternut	<i>Juglans cinerea</i>	S2?	END	E	E	Schedule 1	No	Michigan Flora Online 2011	Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands.	No	No	A site-wide search for Butternut was conducted. No individuals observed.
Birds												
Blue-winged Teal	<i>Spatula discors</i>	S3B,S4M					No	Cornell Lab of Ornithology 2025	Inhabits shallow ponds and wetlands across much of North America. Prefers grasslands bordering small potholes and other freshwater wetlands.	No	No	The shallow marsh does not contain much open water habitat to support this species.
Chimney Swift	<i>Chaetura pelagica</i>	S3B	THR	T	T	Schedule 1	No	OMNR 2000	Commonly found in urban areas near buildings; nests in chimneys, hollow trees, and crevices of rock cliffs. Feeds over open water.	No	No	Chimneys or large cavity trees are not present
American Coot	<i>Fulica americana</i>	S3B,S4N	NAR	NAR	NS	No schedule	No	Cornell Lab of Ornithology 2025	Inhabits open water habitats such as lakes, ponds and wetlands.	No	No	The shallow marsh does not contain much open water habitat to support this species.
Common Gallinule	<i>Gallinula galeata</i>	S3B					No	Cornell Lab of Ornithology 2025	Freshwater and brackish marshes, ponds, and lakes that have a mix of submerged, floating, and emergent aquatic vegetation and are open water year-round. They also use artificial aquaculture ponds, rice fields, sewage lagoons, and urban stormwater retention ponds.	No	No	Suitable habitat is not present.
Upland Sandpiper	<i>Bartramia longicauda</i>	S2B					No	Cornell Lab of Ornithology 2025	Nest in grasslands, pastures, both grazed and ungrazed, road edges, agricultural fields, especially fallow fields, but sometimes hay or other crop fields. Can be observed in areas of minimal woody vegetation and minimal bare ground including blueberry barrens, peatlands, and airports. During migration, this species frequents airfields, agricultural fields, and pastures.	No	No	Suitable habitat is not present.
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	SC	SC	SC	Schedule 1	No	MECP 2024	Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.	Yes	Yes	Treed areas may provide suitable habitat.
Barn Swallow	<i>Hirundo rustica</i>	S4B	SC	SC	T	Schedule 1	Yes	OMNR 2000	Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.	Yes	Yes	The residence and outbuildings may be used for nesting; individuals observed foraging over marsh in past years.
Bank Swallow	<i>Riparia riparia</i>	S4B	THR	T	T	Schedule 1	No	Falconer <i>et al.</i> 2016	Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Usually on banks of river and lakes, but also found in sand and gravel pits.	No	No	Suitable habitat is not present.
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	T	T	Schedule 1	No	OMNR 2000	Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.	No	No	Suitable habitat is not present.
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4B	SC	SC	SC	Schedule 1	No	OMNR 2000	Well-drained grassland or prairie with low cover of grasses, taller weeds or sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities. Requires perches for singing and tracts of grassland generally >5ha.	No	No	Suitable habitat is not present.
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	SC	T	Schedule 1	No	McCracken <i>et al.</i> 2013	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occasionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	No	Suitable habitat is not present.
Eastern Meadowlark	<i>Sturnella magna</i>	S4B,S3N	THR	T	T	Schedule 1	No	OMNR 2000	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	No	Suitable habitat is not present.

Common Name	Scientific Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Comments
Reptiles and Amphibians												
Snapping Turtle	<i>Chelydra serpentina</i>	S4	SC	SC	SC	Schedule 1	Yes	MECP 2024	Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.	Yes	Yes	This species has been observed in the vicinity of the large marsh.
Western Chorus Frog (GLSL - CS pop.)	<i>Pseudacris triseriata</i> pop. 2	S4	NAR	T	T	Schedule 1	No	OMNR 2000	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools.	Yes	Yes	Suitable habitat is present but this species has not been documented during multi-year calling anuran surveys.
Mammals												
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	S3	END	E	NS	No schedule	No surveys conducted	COSEWIC 2023	Roosts primarily in cavities, crevices, and exfoliating bark of typically large-diameter trees in forests and occasionally in or on buildings. Forages in forests of any age, along forests edges and in openings in forests. Primarily overwinters within the U.S.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Eastern Red Bat	<i>Lasiurus borealis</i>	S3	END	E	NS	No schedule	No surveys conducted	COSEWIC 2023	Roosts in foliage of trees; reproductive roosting occurs in upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age. Males occasionally roost in shrubs or saplings. Primarily overwinters within the U.S.	Yes	Yes	Areas of shrubs and young trees may provide suitable roosting habitat.
Hoary Bat	<i>Lasiurus cinereus</i>	S3	END	E	NS	No schedule	No surveys conducted	COSEWIC 2023	Roosts in foliage of trees; reproductive roosting occurs in upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age. Forages in the open, such as open wetlands, grasslands and fields with patchy tree cover. Primarily overwinters in the U.S.	Yes	Yes	The large marsh may provide foraging habitat.
Eastern Small-footed Myotis	<i>Myotis leibii</i>	S2S3	END				No surveys conducted	Humphrey 2017	Roosts, including maternity roosts, in crevices in open, sunny, rocky habitats and in buildings. Hibernates in caves or mines. Hunts in forests and wetlands.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Little Brown Myotis	<i>Myotis lucifugus</i>	S3	END	E	E	Schedule 1	No surveys conducted	Humphrey & Fotherby 2019	Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Northern Myotis	<i>Myotis septentrionalis</i>	S3	END	E	E	Schedule 1	No surveys conducted	Humphrey & Fotherby 2019	Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Tri-colored Bat	<i>Perimyotis subflavus</i>	S3?	END	E	E	Schedule 1	No surveys conducted	Humphrey & Fotherby 2019	Roosts and maternity colonies in older forests and occasionally in barns or other structures. Forage over water and along streams in the forest. Hibernates in caves.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present. The large marsh may provide foraging habitat.
Woodland Vole	<i>Microtus pinetorum</i>	S3?	SC	SC	SC	Schedule 1	No surveys conducted	MECP 2024	Mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.	No	No	Suitable habitat is not present.
American Badger (SW Ontario pop.)	<i>Taxidea taxus jacksoni</i>	S1	END	E	E	Schedule 1	No surveys conducted	OMNR 2000	Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches	No	No	Suitable habitat is not present.

APPENDIX II
Significant Wildlife Habitat Screening Table

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Areas (Terrestrial)	Not Present	Not Present	The study area does not contain agricultural fields with substantial flooded areas in the spring.
Waterfowl Stopover and Staging Areas (Aquatic)	Not Present	Not Present	The marsh feature is comprised of dense cattails and does not include a large area of open water conducive to waterfowl stopover and staging.
Shorebird Migratory Stopover Area	Not Present	Not Present	The study area does not contain shorelines or open aquatic habitat.
Raptor Wintering Area	Not Present	Not Present	The study area contains agricultural fields but forested habitat is limited to small, isolated patches of trees that are unlikely to support wintering raptors.
Bat Hibernacula	Not Present	Not Present	There are no mine shafts, caves, or karst within the study area.
Bat Maternity Colonies	Possible	Candidate	Treed features within the study area are all mid-age stands of Poplar that do not provide suitable habitat for bat maternity colonies. The residence in the far northeast may provide suitable habitat for a maternity colony.
Turtle Wintering Area	Possible	Confirmed	Both Midland Painted Turtle and Snapping Turtle have been observed within and around the large marsh and given the locations of suitable overwintering habitat in the general area, it is quite likely that one or both species overwinter in the marsh.
Reptile Hibernaculum	Possible	Candidate	The residence and old barn foundation in the far northeast of the subject lands may provide suitable snake hibernacula habitat.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	Not Present	Not Present	The study area does not contain suitable banks or cliffs for colonially-nesting bird breeding habitat.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Not Present	Not Present	The study area does not contain suitable habitat for colonially-nesting bird breeding habitat.
Colonially - Nesting Bird Breeding Habitat (Ground)	Not Present	Not Present	The study area does not contain islands or peninsulas in open water or marsh areas.
Migratory Butterfly Stopover Areas	Not Present	Not Present	The study area or subject property is not within 5 km of Lake Ontario.
Landbird Migratory Stopover Areas	Not Present	Not Present	The study area and subject property is not within 5 km of Lake Ontario.
Deer Yarding Areas	Not Present	Not Present	The study area does not contain sizable treed features that would support deer yarding.
Deer Winter Congregation Areas	Not Present	Not Present	The study area does not contain woodlots that are >100 ha in size and all treed features that are present are deciduous and are too small to provide deer winter congregation habitat.
Rare Vegetation Communities			
Cliff and Talus Slopes	Not Present	Not Present	The study area does not contain cliff or talus slopes.
Sand Barrens	Not Present	Not Present	The study area does not contain sand barrens.
Alvar	Not Present	Not Present	The study area does not contain alvar.
Old Growth Forest	Not Present	Not Present	The study area does not contain old growth forest.
Savannah	Not Present	Not Present	The study area does not contain savannah.
Tallgrass Prairie	Not Present	Not Present	The study area does not contain tallgrass prairie.
Other Rare Vegetation Communities	Not Present	Not Present	There are no other rare vegetation communities present within the study area or subject property.
Specialized Wildlife Habitat			
Waterfowl Nesting Area	Possible	Possible	The large marsh has small stands of mid-age Poplar trees adjacent that could be used by nesting waterfowl but these areas are <120 m wide and are sparse. It is very unlikely that the SWH criteria would be fulfilled for waterfowl nesting.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Not Present	Not Present	The study area is 2.5 km from the Grand River and does not contain ideal treed areas for nesting, perching and foraging.
Woodland Raptor Nesting Habitat	Not Present	Not Present	The study areas contains limited forest cover, all units much less than 1 ha in size.
Turtle Nesting Areas	Possible	Possible	The agricultural fields are silt-loam and do not constitute optimal substrate for turtle nesting. Gravel areas existing within the nearby greenhouse properties as well as the shoulders of Kramp Road, Greenhouse Road and Highway 7.
Seeps and Springs	Not Present	Not Present	There are no seeps or springs present within the study area.
Amphibian Breeding Habitat (Woodland)	Not Present	Not Present	Suitable habitat for woodland amphibian breeding is not present within the study area.
Amphibian Breeding Habitat (Wetland)	Not Present	Not Present	The large marsh provides suitable amphibian breeding habitat. NRSI has conducted calling anuran surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. Although a number of the listed species are present (Gray Treefrog, Spring Peeper, Green Frog, Wood Frog, American Toad and Northern Leopard Frog), their abundance does not support SWH status.
Woodland Area-Sensitive Bird Breeding Habitat	Not Present	Not Present	Suitable habitat is not present within the study area.
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	Not Present	Not Present	The large marsh provides suitable marsh bird breeding habitat. NRSI has conducted calling marsh bird call playback surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. To date, Sora and Marsh Wren have been documented from the marsh but the criteria for SWH is not fulfilled.
Open Country Bird Breeding Habitat	Not Present	Not Present	Suitable open country bird breeding habitat is not present within the study area.
Shrub/Early Successional Bird Breeding Habitat	Not Present	Not Present	Suitable early successional bird breeding habitat is not present within the study area.
Terrestrial Crayfish	Candidate	Candidate	The areas surrounding the marsh may provide suitable habitat for terrestrial crayfish.

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Special Concern and Rare Wildlife Species	Not Present	Not Present	Suitable habitat for Special Concern and rare wildlife is not present within the proposed development areas which are annual row crop field and a small area of old field meadow. In general, the potential for rare species is very low within the study area.
Animal Movement Corridors			
Amphibian Movement Corridors	Not Present	Not Present	Suitable conditions are not present for an amphibian movement corridor.
Deer Movement Corridors	Not Present	Not Present	Suitable conditions are not present for a deer movement corridor.

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					Not Present	Not Present
<u>Rationale:</u> Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available ^{cxviii} . <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat ^{cxlviii} . • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMiST ^{cxlix} Index #7 provides development effects and mitigation measures.	The study area does not contain agricultural fields with substantial flooded areas in the spring.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					Not Present	Not Present
<u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100^l or more of listed species for 7 days^l, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH^{cxlviii} • Wetland area and shorelines associated with sites identified within the SWHTG^{cxlviii} Appendix K^{cxlix} are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST^{cxlix} Index #7 provides development effects and mitigation measures.	The marsh feature is comprised of dense cattails and does not include a large area of open water conducive to waterfowl stopover and staging.	
Wildlife Habitat: Shorebird Migratory Stopover Area					Not Present	Not Present
<u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area^{cxlviii} • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • SWHMiST^{cxlix} Index #8 provides development effects and mitigation measures.	The study area does not contain shorelines or open aquatic habitat.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Raptor Wintering Area					Not Present	Not Present
<u>Rationale:</u> Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern:</u> Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha ^{cxlviii, cxlix} with a combination of forest and upland. ^{xvi, xvii, xviii, xix, xx, xxi} Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands ^{cxlix} Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting <u>Information Sources</u> • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years) ^{cxlix} for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • SWHMiST ^{cxlix} Index #10 and #11 provides development effects and mitigation measures.	The study area contains agricultural fields but forested habitat is limited to small, isolated patches of trees that are unlikely to support wintering raptors.	
Wildlife Habitat: Bat Hibernacula					Not Present	Not Present
<u>Rationale</u> Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum ^{cxlviii, ccvii} for most. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects” ^{ccv} • SWHMiST ^{cxlix} Index #1 provides development effects and mitigation measures.	There are no mine shafts, caves, or karst within the study area.	
Wildlife Habitat: Bat Maternity Colonies					Possible	Candidate
<u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings ^{xxii, xxv, xxvi, xxvii, xxxi} (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario ^{xxii} • Maternity colonies located in Mature deciduous or mixed forest stands ^{ccix, ccx} with >10/ha large diameter (>25cm dbh) wildlife trees ^{ccvii} • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 ^{ccxiv} or class 1 or 2 ^{ccxii} • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred ^{ccx} <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by: • >10 Big Brown Bats • >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects” ^{ccv} • SWHMiS T ^{cxlix} Index #12 provides development effects and mitigation measures.	Treed features within the study area are all mid-age stands of Poplar that do not provide suitable habitat for bat maternity colonies. The residence in the far northeast may provide suitable habitat for a maternity colony.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Turtle Wintering Area					Possible	Confirmed
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen ^{cxix, cx, cxi, cxviii} . • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) ^{cviii} • Congregation of turtles is more common where wintering areas are limited and therefore significant ^{cxix, cx, cxi, cxii} . • SWHMiST ^{cxlix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Both Midland Painted Turtle and Snapping Turtle have been observed within and around the large marsh and given the locations of suitable overwintering habitat in the general area, it is quite likely that one or both species overwinter in the marsh.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Snake Hibernaculum					Possible	Candidate
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern:</u> Milksnake Eastern Ribbonsnake <u>Lizard:</u> <u>Special Concern</u> (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	- For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. - Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line^{xiv, i, li, lii, cxii}. - Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. - Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. Information Sources - In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). - Reports and other information from CAs. - Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs - Natural Heritage Information Center (NHIC) - OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: - Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. - Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). <u>Note:</u> If there are Special Concern Species present, then site is SWH <u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWHⁱ - SWHMiST^{cxix} Index #13 provides development effects and mitigation measures for snake hibernacula. - Presence of any active hibernaculum for skink is significant. - SWHMiST^{cxix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	The residence and old barn foundation in the far northeast of the subject lands may provide suitable snake hibernacula habitat.	
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					Not Present	Not Present
<u>Rationale:</u> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources - Reports and other information available from CAs - Ontario Breeding Bird Atlas^{ccv} - Bird Studies Canada; <i>NatureCounts</i> http://www.birdscanada.org/birdmon/ - Field Naturalist clubs	Studies confirming: - Presence of 1 or more nesting sites with 8^{cdvix} or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. - A colony identified as SWH will include a 50m radius habitat area from the peripheral nests^{ccvii} - Field surveys to observe and count swallow nests are to be completed during the breeding season - Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} - SWHMiST^{cdix} Index #4 provides development effects and mitigation measures	The study area does not contain sutiable banks or cliffs for colonially-nesting bird breeding habitat.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Coloniality - Nesting Bird Breeding Habitat (Tree/Shrubs)					Not Present	Not Present
<u>Rationale:</u> Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas^{ccv}, colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5ⁱ or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH^{cc, ccvii} • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMiST^{cxlix} Index #5 provides development effects and mitigation measures.	The study area does not contain suitable habtiat for coloniality-nesting bird breeding habitat.	
Wildlife Habitat: Coloniality - Nesting Bird Breeding Habitat (Ground)					Not Present	Not Present
<u>Rationale:</u> Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas^{ccv}, rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Ternⁱ. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH^{cc, ccvii} • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{hccxi} • SWHMiST^{cxlix} Index #6 provides development effects and mitigation measures.	The study area does not contain islands or peninsulas in open water or marsh areas.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Migratory Butterfly Stopover Areas					Not Present	Not Present
<u>Rationale:</u> Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern:</u> Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: <u>Field:</u> CUM CUS CUT <u>Forest:</u> FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario ^{cxlix} . • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south ^{xooii, xooiii, xooiv, xooxv, xooxvi} . • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat cxlvi, cxlix. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes ^{xooxvii, xooxviii, xooxix, xl, xli} . <u>Information Sources</u> • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct) ^{xliii} . MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day ^{xooxvii} , significant variation can occur between years and multiple years of sampling should occur ^{xl, xliii} . • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • SWHMiST ^{cxlix} Index #16 provides development effects and mitigation measures.	The study area or subject property is not within 5 km of Lake Ontario.	
Wildlife Habitat: Landbird Migratory Stopover Areas					Not Present	Not Present
<u>Rationale:</u> Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha ⁱ in size and within 5km ^{iv, v, vi} of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant ^{cxlix} . • Sites have a variety of habitats; forest, grassland and wetland complexes ^{cxlix} . • The largest sites are more significant ^{cxlix} . • Woodlots and forest fragments are important habitats to migrating birds ^{ccxxviii} , these features located along the shore and located within 5km of Lake Ontario are Candidate SWH ^{cxlviii} . <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMiST ^{cxlix} Index #9 provides development effects and mitigation measures.	The study area and subject property is not within 5 km of Lake Ontario.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Deer Yarding Areas					Not Present	Not Present
<u>Rationale:</u> Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	- Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. - The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%^{CXCIV}. - OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"^{WCXCV} - Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: - Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH^{lvi, lvii, lviii, lix, lx, l}. - Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). - Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations^{CXCV}. - If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST^{CXIX} Index #2 provides development effects and mitigation measures.	The study area does not contain sizable treed features that would support deer yarding.	
Wildlife Habitat: Deer Winter Congregation Areas					Not Present	Not Present
<u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions ^{exlviii}	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	- Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. - Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands^{CXlviii}. - If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. - Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha^{CXXIV}. - Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> - MNRF District Offices - LIO/NRVIS	Studies confirm: - Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF^{CXlviii}. - Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR^l. - Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques^{CXXIV}, ground or road surveys, or a pellet count deer density survey^{CXXV}. - If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST^{CXIX} Index #2 provides development effects and mitigation measures.	The study area does not contain woodlots that are >100 ha in size and all treed features that are present are deciduous and are too small to provide deer winter congregation habitat.	

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Cliff and Talus Slopes					Not Present	Not Present
<u>Rationale:</u> Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes^{lxxviii} • SWHMiST^{cxlix} Index #21 provides development effects and mitigation measures.	The study area does not contain cliff or talus slopes.	
Sand Barrens					Not Present	Not Present
<u>Rationale:</u> Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. <u>Information Sources</u> • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens^{lxxviii} • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)^l. • SWHMiST^{cxlix} Index #20 provides development effects and mitigation measures.	The study area does not contain sand barrens.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Alvar					Not Present	Not Present
<u>Rationale:</u> Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover ^{lxxviii} .	An Alvar site > 0.5 ha in size ^{lxxv} . <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists ^{lxxvi} . • Ontario Nature – Conserving Great Lakes Alvars ^{ccviii} . • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species ^{lxxv, cxlix} at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses ^{lxxv} . • SWHMiST ^{cxlix} Index #17 provides development effects and mitigation measures.	The study area does not contain alvar.	
Old Growth Forest					Not Present	Not Present
<u>Rationale:</u> Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat ^{cxlviii} • The stand will have experienced no recognizable forestry activities ^{cxlviii} • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand ^{lxxviii} • SWHDSS ^{cxlix} Index #23 provides development effects and mitigation measures.	The study area does not contain old growth forest.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Savannah					Not Present	Not Present
<u>Rationale:</u> Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site • Site must be restored or a natural site. • Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in ^{lxv} Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used ^{cxlviii} . • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST^{cxlix} Index #18 provides development effects and mitigation measures.	The study area does not contain savannah.	
Tallgrass Prairie					Not Present	Not Present
<u>Rationale:</u> Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site • Site must be restored or a natural site. • Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in ^{lxv} Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used ^{cxlviii} . • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST^{cxlix} Index #19 provides development effects and mitigation measures.	The study area does not contain tallgrass prairie.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Other Rare Vegetation Communities					Not Present	Not Present
<u>Rationale:</u> Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG ^{cxlviii} . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M ^{cxlviii} The OMNR/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG ^{cxlviii} . • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST ^{cxlix} Index #37 provides development effects and mitigation measures.	There are no other rare vegetation communities present within the study area or subject property.	

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Nesting Area					Not Present	Not Present
<u>Rationale:</u> Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m ^{cxlix} from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur ^{cxlix} . • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m ^{cxlviii} from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST ^{cxlix} Index #25 provides development effects and mitigation measures.	The large marsh has small stands of mid-age Poplar trees adjacent that could be used by nesting waterfowl but these areas are <120 m wide and are sparse. It is very unlikely that the SWH criteria would be fulfilled for waterfowl nesting.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					Not Present	Not Present
<u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern:</u> Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas^{ccv} or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area^{cxlviii}. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH^{ccvii}, maintaining undisturbed shorelines with large trees within this area is important^{cxlviii}. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH^{cv}, ^{ccvii}. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat^{cv}. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant^{ccvii} • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • SWHMIST^{cxlix} Index #26 provides development effects and mitigation measures	The study area is 2.5 km from the Grand River and does not contain ideal treed areas for nesting, perching and foraging.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Woodland Raptor Nesting Habitat					Not Present	Not Present
<u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat ^{lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii} . Interior habitat determined with a 200m buffer ^{cxlviii} . • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF • Check the Ontario Breeding Bird Atlas ^{ccv} or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant ^{cxlviii} . • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH ^{ccvii} . • Barred Owl – a 200m radius around the nest is the SWH ^{ccvii} . • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH ^{ccvii} . • Sharp-shinned Hawk – a 50m radius around the nest is the SWH ^{ccvii} . • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST ^{cxlix} Index #27 provides development effects and mitigation measures.	The study areas contains limited forest cover, all units much less than 1 ha in size.	
Wildlife Habitat: Turtle Nesting Area					Possible	Possible
<u>Rationale:</u> These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) ^{cxlviii} or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH ^l • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH ^{cxlviii} . • Travel routes from wetland to nesting area are to be considered within the SWH ^{cxlix} . • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST ^{cxlix} Index #28 provides development effects and mitigation measures for turtle nesting habitat.	The agricultural fields are silt-loam and do not constitute optimal substrate for turtle nesting. Gravel areas existing within the nearby greenhouse properties as well as the shoulders of Kramp Road, Greenhouse Road and Highway 7.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Seeps and Springs					Not Present	Not Present
<u>Rationale:</u> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system ^{cxvii, cxlix} . • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species ^{cxix, cxx, cxxi, cxxii, cxiii, cxiv} <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat ^{cxlviii} • SWHMiST ^{cxlix} Index #30 provides development effects and mitigation measures	There are no seeps or springs present within the study area.	
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					Not Present	Not Present
<u>Rationale:</u> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m ² (about 25m diameter) ^{ccvii} within or adjacent (within 120m) to a woodland (no minimum size) ^{cbxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx} Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat ^{cxlviii} <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) ^{lxxi} or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys ^{cviii} will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area ^{lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi} if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST ^{cxlix} Index #14 provides development effects and mitigation measures.	Suitable habitat for woodland amphibian breeding is not present within the study area.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					Not Present	Not Present
<u>Rationale:</u> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500m2 (about 25m diameter)^{ccvii} supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats^{clxxxiv}. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNRF Districts and wetland evaluations • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)^{lxxi, lxxiii}, or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys^{cviii} will be required during spring (March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST^{cxlix} Index #15 provides development effects and mitigation measures.	The large marsh provides suitable amphibian breeding habitat. NRSI has conducted calling anuran surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. Although a number of the listed species are present (Gray Treefrog, Spring Peeper, Green Frog, Wood Frog, American Toad and Northern Leopard Frog), their abundance does not support SWH status.	
Woodland Area-Sensitive Bird Breeding Habitat					Not Present	Not Present
<u>Rationale:</u> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.^{cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxi, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix} • Interior forest habitats are at least 200m from forest edge habitat. <u>Information Sources</u> • Local bird clubs • Canadian Wildlife Service (CWS) for the location of forest bird monitoring. • Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species • Reports and other information available from CAs.	• Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • SWHMiST^{cxlix} Index #34 provides development effects and mitigation measures.	Suitable habitat is not present within the study area.	

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	ELC Ecosites	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Marsh Bird Breeding Habitat					Not Present	Not Present
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present^{cxxiv}. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas^{ccv}	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species^l. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH^l. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi}. • SWHMiST^{cxlix} Index #35 provides development effects and mitigation measures	The large marsh provides suitable marsh bird breeding habitat. NRSI has conducted calling marsh bird call playback surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. To date, Sora and Marsh Wren have been documented from the marsh but the criteria for SWH is not fulfilled.	
Wildlife Habitat: Open Country Bird Breeding Habitat					Not Present	Not Present
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha^{clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix}. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)^l. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas^{ccv} • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi}. • SWHMiST^{cxlix} Index #32 provides development effects and mitigation measures.	Suitable open country bird breeding habitat is not present within the study area.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	ELC Ecosites	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					Not Present	Not Present
<u>Rationale:</u> This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	<u>Indicator spp.:</u> Brown Thrasher Clay-coloured Sparrow <u>Common spp.:</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher <u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha ^{clxiv} in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) ^l . Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species ^{clxxiii} . Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas ^{ccv} • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species ^l . • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • SWHMiST ^{cxlix} Index #33 provides development effects and mitigation measures.	Suitable early successional bird breeding habitat is not present within the study area.	
Wildlife Habitat: Terrestrial Crayfish					Candidate	Candidate
<u>Rationale:</u> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. ^{ccii}	Chimney or Digger Crayfish: (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish: (<i>Cambarus Diogenes</i>)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u> • Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites ^{cci} • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult ^{cci} • SWHMiST ^{cxlix} Index #36 provides development effects and mitigation measures.	The areas surrounding the marsh may provide suitable habitat for terrestrial crayfish.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	ELC Ecosites	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Special Concern and Rare Wildlife Species					Not Present	Not Present
<u>Rationale:</u> These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites ^{bxxviii} . <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas ^{ccv} • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST ^{cxlix} Index #37 provides development effects and mitigation measures.	Suitable habitat for Special Concen and rare wildlife is not present within the proposed development areas which are annual row crop field and a small area of old field meadow. In general, the potential for rare species is very low within the study area.	

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Movement Corridors					Not Present	Not Present
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat ^{clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi} . Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule ^l . <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant ^{cxlix} . • Corridors should have at least 15m of vegetation on both sides of waterway ^{cxlix} or be up to 200m wide ^{cxlix} of woodland habitat and with gaps <20m ^{cxlix} . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat ^{cxlix} . • SWHMiST ^{cxlix} Index #40 provides development effects and mitigation measures.	Suitable conditions are not present for an amphibian movement corridor.	
Wildlife Habitat: Deer Movement Corridors					Not Present	Not Present
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule ^l . • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion ^{clxxxii, clxxxiii, cxlix, cxliv} . • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide ^{cxlix} with gaps <20m ^{cxlix} and if following riparian area with at least 15m of vegetation on both sides of waterway ^{cxlix} . Shorter corridors are more significant than longer corridors ^{cxlix} . • SWHMiST ^{cxlix} Index #39 provides development effects and mitigation measures.	Suitable conditions are not present for a deer movement corridor.	

APPENDIX III
EIS Terms of Reference

January 16, 2026

#3681

Trevor Heywood
Resource Planner
Grand River Conservation Authority
400 Clyde Road
Cambridge, Ontario
N1R 5W6

Dear Mr. Heywood,

RE: 2699 Victoria Street North, Breslau – Environmental Impact Study – Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide the following Terms of Reference (TOR) for an Environmental Impact Study (EIS) that is being completed in support of a residential subdivision development located at 2699 Victoria Street North in Breslau, Ontario.

NRSI has reviewed the pre-consultation documents which included a letter from the Grand River Conservation Authority (GRCA), dated August 28, 2025. This correspondence identified the presence of a regulated watercourse and wetlands within the study area and requested that an EIS be prepared. The EIS will demonstrate that the function of the wetlands to attenuate flooding is maintained and will also assess potential impacts to the ecological function of natural features within the study area. This EIS is required as part of a GRCA permit application in accordance with Ontario Regulation 41/24.

The EIS will also speak to natural heritage considerations including significant species, Significant Wildlife Habitat and required setbacks and mitigation to ensure conformity with the Township of Woolwich Official Plan as well as any Region of Waterloo policies. The EIS will refer to the *East Side Subwatersheds: Phase 1 Subwatersheds Characterization Report* (GRCA 2014) for relevant background information. A tree inventory and preservation plan will also be prepared.

The subject lands, referred to as the Bisgould Lands, total approximately 44 ha in size and are located southeast of the intersection of Victoria Street North and Greenhouse Road in the Township of Woolwich. Portions of a Provincially Significant Wetland (PSW) are located within the study area. The largest wetland unit separates an agricultural field in the east from a small cultural meadow in the west. A watercourse is mapped running through the centre of the large cattail marsh and directs surface water beneath Greenhouse Road via a culvert and into the roadside ditch network. The existing conditions are shown on Map 1 as well as appended mapping from the GRCA online mapping application.

The following Terms of Reference (TOR) has been prepared to outline NRSI's proposed work plan to complete the EIS. NRSI has conducted a scoped monitoring program as part of the Hopewell Crossing subdivision to the west. This monitoring has been conducted between 2012 and 2025 (11 monitoring years in total) and includes surveys of marsh breeding birds and

calling anurans. These surveys, and the data collected to date, will be supplemental to the survey effort outlined in this TOR.

The proponent, Thomasfield Homes, has requested that NRSI prepare an EIS for submission in January 2026 based on a preliminary design and grading plan. This EIS will utilize best available information, including wetland water balance calculations, and will make reference to “candidate” features to be verified through field surveys in 2026. For the purpose of the January EIS submission, the team will utilize the existing wetland boundary to inform buffers and grading limits. The initial EIS submission will be updated with an addendum once the suite of 2026 surveys has been completed.

The scope of surveys has been prepared in accordance with the requirements outlined in the *Grand River Conservation Authority Environmental Impact Study Guidelines and Submission Standards for Wetlands* (GRCA 2005).

Please do not hesitate to contact me if you have any questions or comments regarding the following TOR.

Sincerely,
Natural Resource Solutions Inc.



Patrick Deacon
Terrestrial and Wetland Biologist

Cc: John Scarfone, Senior Planner, Township of Woolwich

Environmental Impact Study – 2699 Victoria Street North, Breslau

Terms of Reference

Introduction

Much of the study area consists of annual row crop field and a large wetland that is part of the Breslau Provincially Significant Wetland Complex (Map 1). Vegetation communities within the study area consist of shallow marsh, meadow marsh, swamp thicket, treed swamp, lowland forest and cultural meadow (Figure 1).

Figure 1. Vegetation Communities



An existing residential lot is present along Victoria Street in the far northeast of the subject lands. Two garden nursery businesses are present to the west and a cemetery is present to the east. A Union Gas compressor station along Greenhouse Road (visible on Map 1 but not Figure 1) is surrounded by an area of cultural meadow. Several treed hedgerows are present; the largest is located along the eastern property boundary shared with the cemetery. It appears that most trees in this hedgerow occur on the cemetery property, but their root zones and crowns extend into the Bisgould Lands.

The preliminary design prepared by GSP affords buffers to both the larger wetland and the smaller isolated wetland located in the agricultural field. A stormwater management block is proposed in the area between the two wetlands. The EIS will identify the possible impacts to natural features including the wetlands and watercourse and will recommend mitigation measures to limit negative impacts. A feature-based water balance will be included in the EIS with monthly data figures (pre- and post-development) to be provided by Crozier Engineering.

For the purpose of this report, the term “subject lands” refers to the two parcels that comprise the Bisgould Lands (Map 1). The term “study area” refers to the subject lands plus the

surrounding area (approximately 120 m) for which additional information was collected and reviewed on any natural heritage features present.

Collection and Review of Background Information

Legacy data has been collected from wildlife atlases encompassing an area of approximately 1 to 10 km around the study area. NRSI completed a review of background information on the to inform the scope of this work plan. Background information sources included:

- Region of Waterloo Official Plan (2024);
- Township of Woolwich Official Plan (2025);
- GRCA Web Map Application (GRCA 2022);
- Natural Heritage Information Centre (NHIC) Database (MNR 2025);
- Department of Fisheries and Oceans Aquatic Species at Risk Mapping (2025);
- Ontario Breeding Bird Atlas (BSC *et al.* 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2019); and
- Mammal Atlas of Ontario (Dobbyn 1994).

Species at Risk and Species of Conservation Concern

A Species at Risk (SAR) and Species of Conservation Concern (SCC) screening exercise was completed based on the review of background information and the ELC surveys that were conducted (Appendix I). The screening identifies those SAR and SCC that have the potential to occur within the study area including whether or not suitable habitat is present.

SAR are those listed on the Species at Risk in Ontario (SARO) list (MECP 2024), and include species identified by the Committee on the Status of Species at Risk in Ontario (COSSARO) as provincially Endangered, Threatened, or Special Concern. Regulated SAR refer to species listed as Endangered or Threatened, due to the protection afforded to the species and their habitat under the Endangered Species Act (ESA) (Government of Ontario 2025). It is noted that the Government of Ontario will soon be replacing the ESA with the Species Conservation Act.

SCC include species that are:

- Designated provincially as Special Concern,
- Assigned a conservation status (S-Rank) of S1 to S3 or SH (i.e., critically imperiled, imperiled, vulnerable, or historical),
- Designated federally as Threatened or Endangered by the Committee for the Status of Endangered Wildlife in Canada (COSEWIC), but not provincially by the COSSARO. These species are protected by the federal Species at Risk Act (SARA) but not provincially by the ESA.

Of the 24 SAR and SCC that were identified as having records in the vicinity of the study area, the following 11 species have potentially suitable habitat within the study area:

- | | |
|-----------------------|-------------------------------|
| • Eastern Wood-pewee | • Hoary Bat |
| • Barn Swallow | • Eastern Small-footed Myotis |
| • Snapping Turtle | • Little Brown Myotis |
| • Western Chorus Frog | • Northern Myotis |
| • Silver-haired Bat | • Tri-coloured Bat |
| • Eastern Red Bat | |

Both Snapping Turtle and Barn Swallow have been confirmed as present within the study area through previous surveys and incidental observations by NRSI staff. Calling anuran surveys have never documented Western Chorus Frog to be present between 2012 and 2025 and this species is not present within the study area. The residence in the far northeast of the subject lands may provide suitable bat roosting and maternity colony habitat that will require assessment. Several of the listed species may utilize the large marsh for foraging and this habitat function will remain under the proposed development concept.

Significant Wildlife Habitat

A screening exercise was undertaken as part of the background review to identify potential Significant Wildlife Habitat (SWH) (Appendix II). This review compared site conditions with criteria identified in the SWH Ecoregion 6E Criterion Schedule (MNRF 2015). Based on this exercise, the following SWH types were identified as candidate or confirmed within the study area:

- Seasonal concentration areas: bat maternity colonies (candidate)
- Seasonal concentration areas: turtle wintering area (confirmed)
- Seasonal concentration areas: reptile hibernaculum (candidate)
- Specialized wildlife habitat: turtle nesting areas (candidate)
- Habitat for Species of Conservation Concern: terrestrial crayfish (candidate)

The results of this screening have informed the surveys required to assess such habitat within the subject lands.

Field Surveys

The following is a summary of the field survey methodology that will be used to characterize the existing natural features within the study area. NRSI's assessment of wetland water balance will rely on month-by-month data provided by Crozier, coupled with characterization of the features through field surveys.

Vegetation Community Description and Mapping

Vegetation communities within the study area, including lands adjacent to the subject lands, were characterized and mapped the Ecological Land Classification (ELC) system for Southern Ontario 2nd Edition (Lee *et al.* 1998). A formal map has not yet been prepared but for reference the communities are depicted in Figure 1. The ELC survey occurred in December 2025. Details on vegetation communities were recorded including species composition, dominance, and uncommon species or features.

A two-season (spring and summer) vascular flora inventory will be conducted in the study area in 2026 to supplement the preliminary plant species list. During these surveys, the characterization of the ELC communities, their soils and extent will be verified. No Butternut trees were observed during the December survey. The direct development impacts on natural habitats will be restricted to the cultural meadow located off of Greenhouse Road and the localized SWM outlet to the cattail marsh; neither of these areas have high potential for provincially or regionally significant plant species to be present.

Wetland Boundary Delineation

The wetland boundaries were previously delineated by PLAN B Natural Heritage (in 2010 or

earlier); however, the boundaries should be re-examined. An NRSI staff certified in the Ontario Wetland Evaluation System will delineate the boundaries in May 2026 and will coordinate with GRCA staff to set up a date to verify the limits. Any revisions to the wetland extent will be collected using a sub-10 cm accuracy GPS unit and this data will be provided to the GRCA. For the EIS being submitted in January 2025, the team (NRSI, GSP and Crozier) will utilize the existing GRCA wetland layer which is anticipated to be relatively similar to the current wetland extent, based on our review of air photography.

Anuran Call Surveys

As anuran call surveys have been conducted by NRSI on the subject lands for a total of 11 years between 2012 through 2025, we feel that an adequate data set is available and additional surveys in 2026 are not necessary. The previous surveys were conducted following the methods outlined in the Marsh Monitoring Program for Amphibians (BSC 2009) with one evening visit in each of April, May, and June under suitable weather conditions.

Breeding Bird Surveys

Two early morning breeding bird surveys will be completed between late May and early July 2026 in accordance with Ontario Breeding Bird Atlas (OBBA) protocol (BSC *et al.* 2006). The surveys will be completed between a half-hour before sunrise and 4 hours after and at least 10 days apart. Point counts will be located at 4 locations throughout the subject lands and each station will be surveyed for 10 minutes. Any observations of significant species will be recorded in detail, including their specific observation location(s), observed behaviour, and highest level of breeding evidence.

The existing marsh breeding bird data set will be incorporated. Similar to calling anurans, marsh breeding birds have been monitored on the subject lands for many years, and additional surveys are not proposed for 2026 as part of this work plan.

Bat Habitat Assessment

Bat habitat was assessed during the tree inventory that occurred in early January 2026. Any trees that contain suitable cracks, fissures or peeling bark will be documented and further assessed to determine if bat acoustic surveys are warranted in June 2026. The residence in the far northeast will also be assessed during the tree inventory to determine if access points exist for bats to enter the attic of the house.

Snake Emergence Survey

The residence and old barn foundation in the far northeast will be assessed for their potential to function as snake hibernaculum habitat. If suitable conditions are observed (cracked foundations that could permit snake access below the frost line), a series of snake emergence surveys will be completed to verify the presence or absence of a hibernaculum. These area search surveys would occur in the early spring of 2026.

Aquatic Habitat Assessment

The existing watercourse feature within the study area will be mapped and characterized, including channel dimensions, bank characteristics, substrate composition, habitat types, fish cover features (undercut banks, overhanging vegetation, etc.), water depth and riparian vegetation.

Tree Inventory

A tree inventory was completed by NRSI arborists in early January 2026. This included trees located along the periphery of the development area including hedgerow trees and sparse lot line trees as well as trees within the meadow located off of Greenhouse Road.

Habitat Assessments and Documentation of Other Wildlife

NRSI biologists will assess wildlife habitats within the study area during all site visits. Any features that may be indicative of SWH or habitat for SAR will be documented in detail, photographed, and georeferenced using a hand-held GPS unit. This will include informal searches for terrestrial crayfish chimneys in areas of damp soil to determine if this SWH type is present. Incidental observations of all wildlife will be recorded while on-site.

Environmental Impact Study

An EIS will be prepared that characterizes natural heritage features and functions on and adjacent to the subject lands. The report will provide a review of applicable policies, legislation and regulations that are relevant for the subject lands. The significance and sensitivity of natural heritage features will be outlined. An analysis of potential impacts to wetlands, terrestrial and aquatic resources within the study area, as a result of the proposed subdivision, will be completed. The assessment of potential impacts will be divided into 3 categories:

- Direct impacts associated with natural feature removal or wildlife displacement caused by the actual proposed 'footprint' of the development,
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality as well as construction-related impacts,
- Induced impacts associated with post-construction stresses on the natural features caused by human use of the subject lands.

The impact analysis will assess the function of the stormwater management feature as it relates to wetland water balance, making reference to pre- and post-development water balance catchments and month-by-month flow calculations that will be provided by Crozier. The water balance assessment will employ the TRCA's Wetland Water Balance Risk Evaluation (2017).

Recommendations will be provided to avoid or otherwise minimize or mitigate natural feature impacts associated with the proposed development. Opportunities for enhancement or restoration of natural features will be presented as recommendations. In particular, the development has the opportunity to improve wetland connectivity through naturalization of the SWM block periphery and the establishment of naturalized buffers adjacent to the wetlands in areas that are currently cultivated as row crop fields. The EIS will include the screening tables, species lists, the TOR and site photographs as appendices and will also include a series of maps.

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Map 1

Bisgould Lands EIS

Study Area

Legend

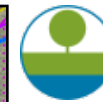
- Study Area (120m)
- Subject Property
- Railway
- Permanent Watercourse
- Intermittent Watercourse
- Waterbody
- Provincially Significant Wetland (PSW)
- Unevaluated Wetland
- Wetland (GRCA)
- Wooded Area
- Regulation Limit (GRCA)

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Aquatic, Terrestrial and Wetland Biologists

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Project: 3681 Date: January 5, 2026	NAD83(CSR)Sv7 - UTM Zone 17 Size: 11x17" 1:5,000
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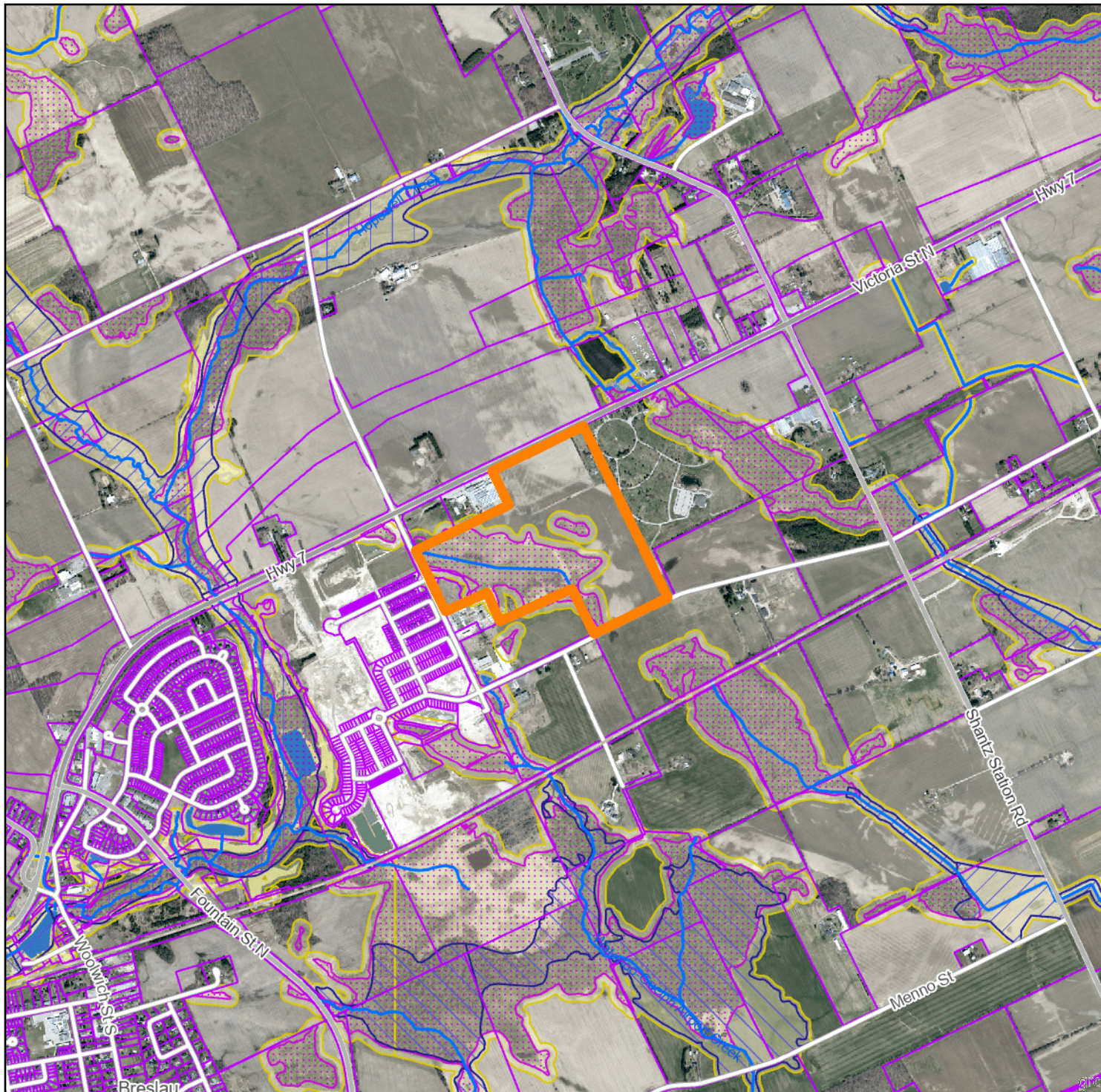
0100200300 Meters



2699 Victoria Street North

Legend

- Regulation Limit (GRCA)
- Slope Erosion (GRCA)
 - Steep
 - Oversteep
 - Toe
- Slope Valley (GRCA)
 - Steep
 - Oversteep
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)
- Floodplain (GRCA)
 - Engineered
 - Estimated
 - Approximate



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Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user. The source for each data layer is shown in parentheses in the map legend. See [Sources and Citations](#) for details.



Appendix I
Species at Risk and Species of Conservation Concern Screening

Species at Risk and Species of Special Concern Screening Table

Common Name	Scientific Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Comments
Vascular Plants												
Butternut	<i>Juglans cinerea</i>	S2?	END	E	E	Schedule 1	No	Michigan Flora Online 2011	Stream banks and swamps, as well as upland beech-maple, oak-hickory, and mixed hardwood stands.	No	No	A site-wide search for Butternut was conducted. No individuals observed.
Birds												
Blue-winged Teal	<i>Spatula discors</i>	S3B,S4M					No	Cornell Lab of Ornithology 2025	Inhabits shallow ponds and wetlands across much of North America. Prefers grasslands bordering small potholes and other freshwater wetlands.	No	No	The shallow marsh does not contain much open water habitat to support this species.
Chimney Swift	<i>Chaetura pelagica</i>	S3B	THR	T	T	Schedule 1	No	OMNR 2000	Commonly found in urban areas near buildings; nests in chimneys, hollow trees, and crevices of rock cliffs. Feeds over open water.	No	No	Chimneys or large cavity trees are not present
American Coot	<i>Fulica americana</i>	S3B,S4N	NAR	NAR	NS	No schedule	No	Cornell Lab of Ornithology 2025	Inhabits open water habitats such as lakes, ponds and wetlands.	No	No	The shallow marsh does not contain much open water habitat to support this species.
Common Gallinule	<i>Gallinula galeata</i>	S3B					No	Cornell Lab of Ornithology 2025	Freshwater and brackish marshes, ponds, and lakes that have a mix of submerged, floating, and emergent aquatic vegetation and are open water year-round. They also use artificial aquaculture ponds, rice fields, sewage lagoons, and urban stormwater retention ponds.	No	No	Suitable habitat is not present.
Upland Sandpiper	<i>Bartramia longicauda</i>	S2B					No	Cornell Lab of Ornithology 2025	Nest in grasslands, pastures, both grazed and ungrazed, road edges, agricultural fields, especially fallow fields, but sometimes hay or other crop fields. Can be observed in areas of minimal woody vegetation and minimal bare ground including blueberry barrens, peatlands, and airports. During migration, this species frequents airfields, agricultural fields, and pastures.	No	No	Suitable habitat is not present.
Eastern Wood-Pewee	<i>Contopus virens</i>	S4B	SC	SC	SC	Schedule 1	No	MECP 2024	Mid-canopy layer of forest clearings and edges of deciduous and mixed forest. Abundant in intermediate-age mature forest stands with little understory vegetation.	Yes	Yes	Treed areas may provide suitable habitat.
Barn Swallow	<i>Hirundo rustica</i>	S4B	SC	SC	T	Schedule 1	Yes	OMNR 2000	Farmlands, rural areas and other open or semi-open areas near body of water. Nests almost exclusively on human-made structures such as open barns, buildings, bridges and culverts.	Yes	Yes	The residence and outbuildings may be used for nesting; individuals observed foraging over marsh in past years.
Bank Swallow	<i>Riparia riparia</i>	S4B	THR	T	T	Schedule 1	No	Falconer <i>et al.</i> 2016	Nests in burrows in natural and human-made settings with vertical faces in silt and sand deposits. Usually on banks of river and lakes, but also found in sand and gravel pits.	No	No	Suitable habitat is not present.
Wood Thrush	<i>Hylocichla mustelina</i>	S4B	SC	T	T	Schedule 1	No	OMNR 2000	Carolinian and Great Lakes-St. Lawrence forest zones. Undisturbed moist mature deciduous or mixed forest with deciduous sapling growth. Near pond or swamp. Must have some trees higher than 12 m.	No	No	Suitable habitat is not present.
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	S4B	SC	SC	SC	Schedule 1	No	OMNR 2000	Well-drained grassland or prairie with low cover of grasses, taller weeds or sandy soil; hayfields or weedy fallow fields; uplands with ground vegetation of various densities. Requires perches for singing and tracts of grassland generally >5ha.	No	No	Suitable habitat is not present.
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	SC	T	Schedule 1	No	McCracken <i>et al.</i> 2013	Large (>10 ha), open expansive grasslands, pastures, hayfields, meadows or fallow fields with dense ground cover. Occasionally nest in large (>50 ha) fields of winter wheat and rye in southwestern Ontario.	No	No	Suitable habitat is not present.
Eastern Meadowlark	<i>Sturnella magna</i>	S4B,S3N	THR	T	T	Schedule 1	No	OMNR 2000	Open pastures, hayfields, grasslands or grassy meadows with elevated singing perches (small trees, shrubs or fence posts). Also weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields or other open areas. Generally prefers larger tracts of habitat >10 ha, but will sometimes use smaller tracts.	No	No	Suitable habitat is not present.

Common Name	Scientific Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	NRSI Observed	Habitat Source	Habitat Preference	Suitable Habitats within Study Area	Suitable Habitats within Subject Property	Comments
Reptiles and Amphibians												
Snapping Turtle	<i>Chelydra serpentina</i>	S4	SC	SC	SC	Schedule 1	Yes	MECP 2024	Slow-flowing rivers and streams, lakes, and permanent or semi-permanent wetlands with soft substrates and vegetation. Key habitat requirements: open areas with structures for basking, open sand or gravel areas for nesting, shallow areas with soft substrates to bury in, soft banks or substrates for hibernation.	Yes	Yes	This species has been observed in the vicinity of the large marsh.
Western Chorus Frog (GLSL - CS pop.)	<i>Pseudacris triseriata</i> pop. 2	S4	NAR	T	T	Schedule 1	No	OMNR 2000	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools.	Yes	Yes	Suitable habitat is present but this species has not been documented during multi-year calling anuran surveys.
Mammals												
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	S3	END	E	NS	No schedule	No surveys conducted	COSEWIC 2023	Roosts primarily in cavities, crevices, and exfoliating bark of typically large-diameter trees in forests and occasionally in or on buildings. Forages in forests of any age, along forests edges and in openings in forests. Primarily overwinters within the U.S.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Eastern Red Bat	<i>Lasiurus borealis</i>	S3	END	E	NS	No schedule	No surveys conducted	COSEWIC 2023	Roosts in foliage of trees; reproductive roosting occurs in upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age. Males occasionally roost in shrubs or saplings. Primarily overwinters within the U.S.	Yes	Yes	Areas of shrubs and young trees may provide suitable roosting habitat.
Hoary Bat	<i>Lasiurus cinereus</i>	S3	END	E	NS	No schedule	No surveys conducted	COSEWIC 2023	Roosts in foliage of trees; reproductive roosting occurs in upper foliage of typically large-diameter, super-canopy trees in deciduous and coniferous forests of any age. Forages in the open, such as open wetlands, grasslands and fields with patchy tree cover. Primarily overwinters in the U.S.	Yes	Yes	The large marsh may provide foraging habitat.
Eastern Small-footed Myotis	<i>Myotis leibii</i>	S2S3	END				No surveys conducted	Humphrey 2017	Roosts, including maternity roosts, in crevices in open, sunny, rocky habitats and in buildings. Hibernates in caves or mines. Hunts in forests and wetlands.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Little Brown Myotis	<i>Myotis lucifugus</i>	S3	END	E	E	Schedule 1	No surveys conducted	Humphrey & Fotherby 2019	Uses caves, quarries, tunnels, hollow trees or buildings for roosting. Winters in humid caves. Maternity sites in dark warm areas such as attics and barns. Feeds primarily in wetlands and forest edges.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Northern Myotis	<i>Myotis septentrionalis</i>	S3	END	E	E	Schedule 1	No surveys conducted	Humphrey & Fotherby 2019	Roosts in houses and man-made structures but prefers hollow trees or under loose bark. Hibernates in mines or caves. Hunts within forest, below the canopy.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present.
Tri-colored Bat	<i>Perimyotis subflavus</i>	S3?	END	E	E	Schedule 1	No surveys conducted	Humphrey & Fotherby 2019	Roosts and maternity colonies in older forests and occasionally in barns or other structures. Forage over water and along streams in the forest. Hibernates in caves.	Yes	Yes	The residence may provide suitable roosting habitat. Suitable cavity trees are not present. The large marsh may provide foraging habitat.
Woodland Vole	<i>Microtus pinetorum</i>	S3?	SC	SC	SC	Schedule 1	No surveys conducted	MECP 2024	Mature deciduous forest in the Carolinian region where there is a deep litter layer that allows it to burrow.	No	No	Suitable habitat is not present.
American Badger (SW Ontario pop.)	<i>Taxidea taxus jacksoni</i>	S1	END	E	E	Schedule 1	No surveys conducted	OMNR 2000	Open grasslands and oak savannahs; dens in new hole or enlarged existing hole; sometimes makes food caches	No	No	Suitable habitat is not present.

Appendix II
Significant Wildlife Habitat Screening

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Seasonal Concentration Areas			
Waterfowl Stopover and Staging Areas (Terrestrial)	Not Present	Not Present	The study area does not contain agricultural fields with substantial flooded areas in the spring.
Waterfowl Stopover and Staging Areas (Aquatic)	Not Present	Not Present	The marsh feature is comprised of dense cattails and does not include a large area of open water conducive to waterfowl stopover and staging.
Shorebird Migratory Stopover Area	Not Present	Not Present	The study area does not contain shorelines or open aquatic habitat.
Raptor Wintering Area	Not Present	Not Present	The study area contains agricultural fields but forested habitat is limited to small, isolated patches of trees that are unlikely to support wintering raptors.
Bat Hibernacula	Not Present	Not Present	There are no mine shafts, caves, or karst within the study area.
Bat Maternity Colonies	Possible	Candidate	Treed features within the study area are all mid-age stands of Poplar that do not provide suitable habitat for bat maternity colonies. The residence in the far northeast may provide suitable habitat for a maternity colony.
Turtle Wintering Area	Possible	Confirmed	Both Midland Painted Turtle and Snapping Turtle have been observed within and around the large marsh and given the locations of suitable overwintering habitat in the general area, it is quite likely that one or both species overwinter in the marsh.
Reptile Hibernaculum	Possible	Candidate	The residence and old barn foundation in the far northeast of the subject lands may provide suitable snake hibernacula habitat.
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	Not Present	Not Present	The study area does not contain suitable banks or cliffs for colonially-nesting bird breeding habitat.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	Not Present	Not Present	The study area does not contain suitable habitat for colonially-nesting bird breeding habitat.
Colonially - Nesting Bird Breeding Habitat (Ground)	Not Present	Not Present	The study area does not contain islands or peninsulas in open water or marsh areas.
Migratory Butterfly Stopover Areas	Not Present	Not Present	The study area or subject property is not within 5 km of Lake Ontario.
Landbird Migratory Stopover Areas	Not Present	Not Present	The study area and subject property is not within 5 km of Lake Ontario.
Deer Yarding Areas	Not Present	Not Present	The study area does not contain sizable treed features that would support deer yarding.
Deer Winter Congregation Areas	Not Present	Not Present	The study area does not contain woodlots that are >100 ha in size and all treed features that are present are deciduous and are too small to provide deer winter congregation habitat.
Rare Vegetation Communities			
Cliff and Talus Slopes	Not Present	Not Present	The study area does not contain cliff or talus slopes.
Sand Barrens	Not Present	Not Present	The study area does not contain sand barrens.
Alvar	Not Present	Not Present	The study area does not contain alvar.
Old Growth Forest	Not Present	Not Present	The study area does not contain old growth forest.
Savannah	Not Present	Not Present	The study area does not contain savannah.
Tallgrass Prairie	Not Present	Not Present	The study area does not contain tallgrass prairie.
Other Rare Vegetation Communities	Not Present	Not Present	There are no other rare vegetation communities present within the study area or subject property.
Specialized Wildlife Habitat			
Waterfowl Nesting Area	Possible	Possible	The large marsh has small stands of mid-age Poplar trees adjacent that could be used by nesting waterfowl but these areas are <120 m wide and are sparse. It is very unlikely that the SWH criteria would be fulfilled for waterfowl nesting.
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Not Present	Not Present	The study area is 2.5 km from the Grand River and does not contain ideal treed areas for nesting, perching and foraging.
Woodland Raptor Nesting Habitat	Not Present	Not Present	The study areas contains limited forest cover, all units much less than 1 ha in size.
Turtle Nesting Areas	Possible	Possible	The agricultural fields are silt-loam and do not constitute optimal substrate for turtle nesting. Gravel areas existing within the nearby greenhouse properties as well as the shoulders of Kramp Road, Greenhouse Road and Highway 7.
Seeps and Springs	Not Present	Not Present	There are no seeps or springs present within the study area.
Amphibian Breeding Habitat (Woodland)	Not Present	Not Present	Suitable habitat for woodland amphibian breeding is not present within the study area.
Amphibian Breeding Habitat (Wetland)	Not Present	Not Present	The large marsh provides suitable amphibian breeding habitat. NRSI has conducted calling anuran surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. Although a number of the listed species are present (Gray Treefrog, Spring Peeper, Green Frog, Wood Frog, American Toad and Northern Leopard Frog), their abundance does not support SWH status.
Woodland Area-Sensitive Bird Breeding Habitat	Not Present	Not Present	Suitable habitat is not present within the study area.
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	Not Present	Not Present	The large marsh provides suitable marsh bird breeding habitat. NRSI has conducted calling marsh bird call playback surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. To date, Sora and Marsh Wren have been documented from the marsh but the criteria for SWH is not fulfilled.
Open Country Bird Breeding Habitat	Not Present	Not Present	Suitable open country bird breeding habitat is not present within the study area.
Shrub/Early Successional Bird Breeding Habitat	Not Present	Not Present	Suitable early successional bird breeding habitat is not present within the study area.
Terrestrial Crayfish	Candidate	Candidate	The areas surrounding the marsh may provide suitable habitat for terrestrial crayfish.

Significant Wildlife Habitat Type	Presence Within Study Area	Presence Within Subject Property	Assessment Details
Special Concern and Rare Wildlife Species	Not Present	Not Present	Suitable habitat for Special Concern and rare wildlife is not present within the proposed development areas which are annual row crop field and a small area of old field meadow. In general, the potential for rare species is very low within the study area.
Animal Movement Corridors			
Amphibian Movement Corridors	Not Present	Not Present	Suitable conditions are not present for an amphibian movement corridor.
Deer Movement Corridors	Not Present	Not Present	Suitable conditions are not present for a deer movement corridor.

Significant Wildlife Habitat Assessment Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)					Not Present	Not Present
<u>Rationale:</u> Habitat important to migrating waterfowl.	American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available ^{cxviii} . <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Field Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • Any mixed species aggregations of 100 or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependent on local site conditions and adjacent land use is the significant wildlife habitat ^{cxlviii} . • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMiST ^{cxlix} Index #7 provides development effects and mitigation measures.	The study area does not contain agricultural fields with substantial flooded areas in the spring.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)					Not Present	Not Present
<u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked Duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water). <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100^l or more of listed species for 7 days^l, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH^{cxlviii} • Wetland area and shorelines associated with sites identified within the SWHTG^{cxlviii} Appendix K^{cxlix} are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST^{cxlix} Index #7 provides development effects and mitigation measures.	The marsh feature is comprised of dense cattails and does not include a large area of open water conducive to waterfowl stopover and staging.	
Wildlife Habitat: Shorebird Migratory Stopover Area					Not Present	Not Present
<u>Rationale:</u> High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin Whimbrel	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • Natural Heritage Information Center (NHIC) Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area^{cxlviii} • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • SWHMiST^{cxlix} Index #8 provides development effects and mitigation measures.	The study area does not contain shorelines or open aquatic habitat.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Raptor Wintering Area					Not Present	Not Present
<u>Rationale:</u> Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern:</u> Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class: Forest: FOD, FOM, FOC Upland: CUM, CUT, CUS, CUW	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha ^{cxlviii, cxlix} with a combination of forest and upland. ^{xvi, xvii, xviii, xix, xx, xxi} Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands ^{cxlix} Field area of the habitat is to be wind swept with limited snow depth or accumulation. Eagle sites have open water, large trees and snags available for roosting <u>Information Sources</u> • OMNRF Ecologist or Biologist • Field Natural Clubs • Natural Heritage Information Center (NHIC) Raptor Winter Concentration Area • Data from Bird Studies Canada • Reports and other information available from Conservation Authorities CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two listed hawk/owl species • To be significant a site must be used regularly (3 in 5 years) ^{cxlix} for a minimum of 20 days by the above number of birds • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • SWHMiST ^{cxlix} Index #10 and #11 provides development effects and mitigation measures.	The study area contains agricultural fields but forested habitat is limited to small, isolated patches of trees that are unlikely to support wintering raptors.	
Wildlife Habitat: Bat Hibernacula					Not Present	Not Present
<u>Rationale</u> Bat hibernacula are rare habitats in Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • Natural Heritage Information Center (NHIC) Bat Hibernaculum • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200m radius around the entrance of the hibernaculum ^{cxlviii, ccvii} for most. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects” ^{ccv} • SWHMiST ^{cxlix} Index #1 provides development effects and mitigation measures.	There are no mine shafts, caves, or karst within the study area.	
Wildlife Habitat: Bat Maternity Colonies					Possible	Candidate
<u>Rationale:</u> Known locations of forested bat maternity colonies is extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	Maternity colonies can be found in tree cavities, vegetation and often in buildings ^{xxii, xxv, xxvi, xxvii, xxxi} (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario ^{xxii} • Maternity colonies located in Mature deciduous or mixed forest stands ^{ccix, ccx} with >10/ha large diameter (>25cm dbh) wildlife trees ^{ccvii} • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 ^{ccxiv} or class 1 or 2 ^{ccxii} • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred ^{ccx} <u>Information Sources</u> • OMNRF for possible locations and contact for local experts • University Biology Departments with bat experts.	• Maternity Colonies with confirmed use by: • >10 Big Brown Bats • >5 Adult Female Silver-haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for wind Power Projects” ^{ccv} • SWHMiS T ^{cxlix} Index #12 provides development effects and mitigation measures.	Treed features within the study area are all mid-age stands of Poplar that do not provide suitable habitat for bat maternity colonies. The residence in the far northeast may provide suitable habitat for a maternity colony.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Turtle Wintering Area					Possible	Confirmed
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles - ELC Community Classes: SW, MA, OA and SA; ELC Community Series: FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen ^{cxix, cx, cxi, cxviii} . • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> • EIS studies carried out by Conservation Authorities. • Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNRF ecologist or biologist • Natural Heritage Information Center (NHIC)	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) ^{cviii} • Congregation of turtles is more common where wintering areas are limited and therefore significant ^{cxix, cx, cxi, cxii} . • SWHMiST ^{cxlix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Both Midland Painted Turtle and Snapping Turtle have been observed within and around the large marsh and given the locations of suitable overwintering habitat in the general area, it is quite likely that one or both species overwinter in the marsh.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Snake Hibernaculum					Possible	Candidate
<u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant	<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake <u>Special Concern:</u> Milksnake Eastern Ribbonsnake <u>Lizard:</u> <u>Special Concern</u> (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	- For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. The existence of features that go below the frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. - Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line^{xiv, i, li, lii, cxii}. - Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. - Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures cciii. Information Sources - In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g. old dug wells). - Reports and other information from CAs. - Local Field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. clubs - Natural Heritage Information Center (NHIC) - OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: - Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. - Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct). <u>Note:</u> If there are Special Concern Species present, then site is SWH <u>Note:</u> Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30m buffer is the SWHⁱ - SWHMiST^{cxlix} Index #13 provides development effects and mitigation measures for snake hibernacula. - Presence of any active hibernaculum for skink is significant. - SWHMiST^{cxlix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	The residence and old barn foundation in the far northeast of the subject lands may provide suitable snake hibernacula habitat.	
Wildlife Habitat: Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)					Not Present	Not Present
<u>Rationale:</u> Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow populations are declining in Ontario.	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources - Reports and other information available from CAs - Ontario Breeding Bird Atlas^{ccv} - Bird Studies Canada; <i>NatureCounts</i> http://www.birdscanada.org/birdmon/ - Field Naturalist clubs	Studies confirming: - Presence of 1 or more nesting sites with 8^{cxlix} or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. - A colony identified as SWH will include a 50m radius habitat area from the peripheral nests^{ccvii} - Field surveys to observe and count swallow nests are to be completed during the breeding season - Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{ccxi} - SWHMiST^{cxlix} Index #4 provides development effects and mitigation measures	The study area does not contain suitable banks or cliffs for colonially-nesting bird breeding habitat.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Coloniality - Nesting Bird Breeding Habitat (Tree/Shrubs)					Not Present	Not Present
<u>Rationale:</u> Large Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night-heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas^{ccv}, colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries • Reports and other information available from CAs • MNRF District Offices • Local naturalist clubs	Studies confirming: • Presence of 5ⁱ or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH^{cc, ccvii} • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHMiST^{cxlix} Index #5 provides development effects and mitigation measures.	The study area does not contain suitable habtiat for coloniality-nesting bird breeding habitat.	
Wildlife Habitat: Coloniality - Nesting Bird Breeding Habitat (Ground)					Not Present	Not Present
<u>Rationale:</u> Colonies are important to local bird populations, typically sites are only known colony in area and are used annually.	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6 MAS1 – 3 CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas^{ccv}, rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs • Natural Heritage Information Center (NHIC) Colonial Waterbird Nesting Area • MNRF District Offices • Field naturalist clubs	Studies confirming: • Presence of >25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Ternⁱ. • Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH^{cc, ccvii} • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"^{hccxi} • SWHMiST^{cxlix} Index #6 provides development effects and mitigation measures.	The study area does not contain islands or peninsulas in open water or marsh areas.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Migratory Butterfly Stopover Areas					Not Present	Not Present
<u>Rationale:</u> Butterfly stopovers areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern:</u> Monarch	Combination of ELC Community Series: Need to have present one Community Series from each landclass: <u>Field:</u> CUM CUS CUT <u>Forest:</u> FOC FOM FOD CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario ^{cxlix} . • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south ^{xxviii, xxviii, xxviii, xxv, xxviii} . • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat ^{cxlviii, cxlix} . • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes ^{xxviii, xxviii, xxviii, xl, xl} . <u>Information Sources</u> • OMNRF (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Field Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct) ^{xliii} . MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day ^{xxviii} , significant variation can occur between years and multiple years of sampling should occur ^{xl, xliii} . • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant. • SWHMiST ^{cxlix} Index #16 provides development effects and mitigation measures.	The study area or subject property is not within 5 km of Lake Ontario.	
Wildlife Habitat: Landbird Migratory Stopover Areas					Not Present	Not Present
<u>Rationale:</u> Sites with a high diversity of species as well as high number are most significant	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha ⁱ in size and within 5km ^{iv, v, vi} of Lake Ontario. • If multiple woodlands are located along the shoreline, those woodlands <2km from Lake Ontario are more significant ^{cxlix} . • Sites have a variety of habitats; forest, grassland and wetland complexes ^{cxlix} . • The largest sites are more significant ^{cxlix} . • Woodlots and forest fragments are important habitats to migrating birds ^{ccxviii} , these features located along the shore and located within 5km of Lake Ontario are Candidate SWH ^{cxlviii} . <u>Information Sources</u> • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp. with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr/May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" ^{ccxi} • SWHMiST ^{cxlix} Index #9 provides development effects and mitigation measures.	The study area and subject property is not within 5 km of Lake Ontario.	

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Deer Yarding Areas					Not Present	Not Present
<u>Rationale:</u> Winter habitat for deer is considered to be the main factor for northern deer populations. In winter, deer congregate in "yards" to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include: FOM, FOC, SWM and SWC. Or these ELC Ecosites: CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%^{CXCIV}. • OMNRF determines deer yards following methods outlined in "Selected Wildlife and Habitat Features: Inventory Manual"^{WCXCV} • Woodlots with high densities of deer due to artificial feeding are not significant.	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH^{lvi, lvii, lviii, lix, lx, l}. • Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations^{CXCV}. • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST^{CXIX} Index #2 provides development effects and mitigation measures.	The study area does not contain sizable treed features that would support deer yarding.	
Wildlife Habitat: Deer Winter Congregation Areas					Not Present	Not Present
<u>Rationale:</u> Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions ^{exlviii}	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50ha may also be used.	• Woodlots will typically be >100 ha in size. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands^{CXlviii}. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha^{CXXIV}. • Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> • MNRF District Offices • LIO/NRVIS	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF^{CXlviii}. • Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR^l. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques^{CXXIV}, ground or road surveys, or a pellet count deer density survey^{CXXV}. • If a SWH is determined for Deer Wintering Area of if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHMiST^{CXIX} Index #2 provides development effects and mitigation measures.	The study area does not contain woodlots that are >100 ha in size and all treed features that are present are deciduous and are too small to provide deer winter congregation habitat.	

Significant Wildlife Habitat Assessment Tables

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Cliff and Talus Slopes					Not Present	Not Present
<u>Rationale:</u> Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris.	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNRF District • Natural Heritage Information Center (NHIC) has location information on their website • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes^{lxxviii} • SWHMiST^{cxlix} Index #21 provides development effects and mitigation measures.	The study area does not contain cliff or talus slopes.	
Sand Barrens					Not Present	Not Present
<u>Rationale:</u> Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry.	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always <60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	Any sand barren area, >0.5ha in size. <u>Information Sources</u> • OMNRF Districts. • Natural Heritage Information Center (NHIC) has location information on their website • Field naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens^{lxxviii} • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)^l. • SWHMiST^{cxlix} Index #20 provides development effects and mitigation measures.	The study area does not contain sand barrens.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Alvar					Not Present	Not Present
<u>Rationale:</u> Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregion 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema branchiatum These indicator species are very specific to Alvars within Ecoregion 6E	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoo geographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover ^{lxxviii} .	An Alvar site > 0.5 ha in size ^{lxxv} . <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists ^{lxxvi} . • Ontario Nature – Conserving Great Lakes Alvars ^{ccviii} . • Natural Heritage Information Center (NHIC) has location information on their website • Field Naturalist clubs • Conservation Authorities	Field studies identify four of the five Alvar indicator species ^{lxxv, cxlix} at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotics sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses ^{lxxv} . • SWHMiST ^{cxlix} Index #17 provides development effects and mitigation measures.	The study area does not contain alvar.	
Old Growth Forest					Not Present	Not Present
<u>Rationale:</u> Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland Stands areas 30ha or greater in size or with at least 10 ha interior habitat assuming 100m buffer at edge of forest Í. <u>Information Sources</u> • OMNRF Forest Resource Inventory mapping • OMNRF Forester, Ecologist or Biologist • Field Local naturalist clubs • Conservation Authorities • Sustainable Forestry License (SFL) companies will possibly know locations through field operations. • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat ^{cxlviii} • The stand will have experienced no recognizable forestry activities ^{cxlviii} • The area of Forest Ecosites combined to make up the stand is the SWH. • Determine ELC Vegetation Type for forest stand ^{lxxviii} • SWHDSS ^{cxlix} Index #23 provides development effects and mitigation measures.	The study area does not contain old growth forest.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Savannah					Not Present	Not Present
<u>Rationale:</u> Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.	• No minimum size to site • Site must be restored or a natural site. • Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information on their website • OMNRF Ecologists • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Savannah indicator species listed in ^{lxv} Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 6E should be used ^{cxlviii} . • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics sp.). • SWHMiST^{cxlix} Index #18 provides development effects and mitigation measures.	The study area does not contain savannah.	
Tallgrass Prairie					Not Present	Not Present
<u>Rationale:</u> Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.	• No minimum size to site • Site must be restored or a natural site. • Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • OMNR Districts • Natural Heritage Information Center (NHIC) has location information available on their website • Field naturalists clubs • Conservation Authorities	Field studies confirm one or more of the Prairie indicator species listed in ^{lxv} Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 6E should be used ^{cxlviii} . • Area of the ELC Ecosite is the SWH • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHMiST^{cxlix} Index #19 provides development effects and mitigation measures.	The study area does not contain tallgrass prairie.	

Table 2. Characteristics of Rare Vegetation Communities for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	ELC Ecosite Codes	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Other Rare Vegetation Communities					Not Present	Not Present
<u>Rationale:</u> Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG ^{cxlviii} . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M ^{cxlviii} The OMNR/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • Natural Heritage Information Center (NHIC) has location information available on their website • OMNRF Districts • Field naturalists clubs • Conservation Authorities	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG ^{cxlviii} . • Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST ^{cxlix} Index #37 provides development effects and mitigation measures.	There are no other rare vegetation communities present within the study area or subject property.	

Significant Wildlife Habitat Assessment Tables

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Waterfowl Nesting Area					Not Present	Not Present
<u>Rationale:</u> Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120m ^{cxlix} from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120m of each individual wetland where waterfowl nesting is known to occur ^{cxlix} . • Upland areas should be at least 120m wide so that predators such as raccoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120m ^{cxlviii} from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST ^{cxlix} Index #25 provides development effects and mitigation measures.	The large marsh has small stands of mid-age Poplar trees adjacent that could be used by nesting waterfowl but these areas are <120 m wide and are sparse. It is very unlikely that the SWH criteria would be fulfilled for waterfowl nesting.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Bald Eagle and Osprey Nesting, Foraging and Perching Habitat					Not Present	Not Present
<u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern:</u> Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	• Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> • Natural Heritage Information Center (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. • MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNRF Districts • Sustainable Forestry License (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas^{ccv} or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs. • Field naturalists clubs	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area^{cxlviii}. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300m radius around the nest or the contiguous woodland stand is the SWH^{ccvii}, maintaining undisturbed shorelines with large trees within this area is important^{cxlviii}. • For a Bald Eagle the active nest and a 400-800m radius around the nest is the SWH^{cv}, ^{ccvii}. Area of the habitat from 400-800m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat^{cv}. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant^{ccvii} • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • SWHMIST^{cxlix} Index #26 provides development effects and mitigation measures	The study area is 2.5 km from the Grand River and does not contain ideal treed areas for nesting, perching and foraging.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Woodland Raptor Nesting Habitat					Not Present	Not Present
<u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3.	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat ^{lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv, xcvi, cxxxiii} . Interior habitat determined with a 200m buffer ^{cxlviii} . • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Cooper's hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNRF • Check the Ontario Breeding Bird Atlas ^{ccv} or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada • Reports and other information available from CAs	Studies confirm: • Presence of 1 or more active nests from species list is considered significant ^{cxlviii} . • Red-shouldered Hawk and Northern Goshawk – a 400m radius around the nest or 28ha area of habitat is the SWH ^{ccvii} . • Barred Owl – a 200m radius around the nest is the SWH ^{ccvii} . • Broad-winged Hawk and Coopers Hawk – a 100m radius around the nest is the SWH ^{ccvii} . • Sharp-shinned Hawk – a 50m radius around the nest is the SWH ^{ccvii} . • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST ^{cxlix} Index #27 provides development effects and mitigation measures.	The study areas contains limited forest cover, all units much less than 1 ha in size.	
Wildlife Habitat: Turtle Nesting Area					Possible	Possible
<u>Rationale:</u> These habitats are rare and when identified will often be the only breeding site for local populations of turtles	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) ^{cxlviii} or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Center (NHIC) • Field Naturalist clubs and landowners	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH ^l • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependent on slope, riparian vegetation and adjacent land use is the SWH ^{cxlviii} . • Travel routes from wetland to nesting area are to be considered within the SWH ^{cxlix} . • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST ^{cxlix} Index #28 provides development effects and mitigation measures for turtle nesting habitat.	The agricultural fields are silt-loam and do not constitute optimal substrate for turtle nesting. Gravel areas existing within the nearby greenhouse properties as well as the shoulders of Kramp Road, Greenhouse Road and Highway 7.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Seeps and Springs					Not Present	Not Present
<u>Rationale:</u> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system ^{cxvii, cxlix} . • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species ^{cxix, cxx, cxxi, cxxii, cxiii, cxiv} <u>Information Sources</u> • Topographical Map • Thermography • Hydrological surveys conducted by CAs and MOE • Field naturalists clubs and landowners • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat ^{cxlviii} • SWHMiST ^{cxlix} Index #30 provides development effects and mitigation measures	There are no seeps or springs present within the study area.	
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)					Not Present	Not Present
<u>Rationale:</u> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians.	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m ² (about 25m diameter) ^{ccvii} within or adjacent (within 120m) to a woodland (no minimum size) ^{cbxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx} Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat ^{cxlviii} <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF District • OMNRF wetland evaluations • Field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) ^{lxxi} or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys ^{cviii} will be required during the spring March-June when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the woodland area plus a 230m radius of woodland area ^{lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi} if a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is the be included in the habitat. • SWHMiST ^{cxlix} Index #14 provides development effects and mitigation measures.	Suitable habitat for woodland amphibian breeding is not present within the study area.	

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH	Assessment Details	
	Wildlife Species	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Breeding Habitat (Wetland)					Not Present	Not Present
<u>Rationale:</u> These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Tree frog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	- Wetlands >500m2 (about 25m diameter)^{ccvii} supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats^{clxxxiv}. - Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. - Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> - Ontario Herpetofaunal Summary Atlas (or other similar atlases) - Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. - OMNRF Districts and wetland evaluations - Reports and other information available from CAs.	Studies confirm: - Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species and with at least 20 individuals (adults or eggs masses)^{lxxi, lxxiii}, or 2 or more of the listed frog/toad species with Call Level Codes of 3. or; Wetland with confirmed breeding Bullfrogs are significant. - The ELC ecosite wetland area and the shoreline are the SWH. - A combination of observational study and call count surveys^{cviii} will be required during spring (March to June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. - If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST^{cxlix} Index #15 provides development effects and mitigation measures.	The large marsh provides suitable amphibian breeding habitat. NRSI has conducted calling anuran surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. Although a number of the listed species are present (Gray Treefrog, Spring Peeper, Green Frog, Wood Frog, American Toad and Northern Leopard Frog), their abundance does not support SWH status.	
Woodland Area-Sensitive Bird Breeding Habitat					Not Present	Not Present
<u>Rationale:</u> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-Bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Special Concern: Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series: FOC FOM FOD SWC SWM SWD	- Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.^{cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxv, cxxvi, cxxxvii, cxxxviii, cxxxix, cxi, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cl, cli, clii, cliii, cliv, clv, clvii, clviii, clix} - Interior forest habitats are at least 200m from forest edge habitat. <u>Information Sources</u> - Local bird clubs - Canadian Wildlife Service (CWS) for the location of forest bird monitoring. - Bird studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to greatest value to interior species - Reports and other information available from CAs.	- Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. - Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. - Conduct field investigations in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxlix} Index #34 provides development effects and mitigation measures.	Suitable habitat is not present within the study area.	

Significant Wildlife Habitat Assessment Tables

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	ELC Ecosites	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Marsh Bird Breeding Habitat					Not Present	Not Present
Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Gallinule American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present^{cxxiv}. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. Information Sources • Contact OMNRF, wetland evaluations are a good source of information. • Field naturalist clubs • Natural Heritage Information Center (NHIC) Records • Reports and other information available from CAs. • Ontario Breeding Bird Atlas^{ccv}	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species^l. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH^l. • Area of the ELC ecosite is the SWH • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi}. • SWHMiST^{cxlix} Index #35 provides development effects and mitigation measures	The large marsh provides suitable marsh bird breeding habitat. NRSI has conducted calling marsh bird call playback surveys within this wetland, as part of the Hopewell Creek monitoring program, between 2012-2025. To date, Sora and Marsh Wren have been documented from the marsh but the criteria for SWH is not fulfilled.	
Wildlife Habitat: Open Country Bird Breeding Habitat					Not Present	Not Present
Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha^{clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix}. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)^l. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. Information Sources • Agricultural land classification maps, Ministry of Agriculture. • Ask local birders • Ontario Breeding Bird Atlas^{ccv} • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owl is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi}. • SWHMiST^{cxlix} Index #32 provides development effects and mitigation measures.	Suitable open country bird breeding habitat is not present within the study area.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	ELC Ecosites	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat					Not Present	Not Present
<u>Rationale:</u> This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	<u>Indicator spp.:</u> Brown Thrasher Clay-coloured Sparrow <u>Common spp.:</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher <u>Special Concern:</u> Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species.	Large field areas succeeding to shrub and thicket habitats>10ha ^{clxiv} in size. • Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) ^l . Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species ^{clxxiii} . Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. <u>Information Sources</u> • Agricultural land classification maps Ministry of Agriculture Local bird clubs • Ontario Breeding Bird Atlas ^{ccv} • Reports and other information available from CAs	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species ^l . • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} • SWHMiST ^{cxlix} Index #33 provides development effects and mitigation measures.	Suitable early successional bird breeding habitat is not present within the study area.	
Wildlife Habitat: Terrestrial Crayfish					Candidate	Candidate
<u>Rationale:</u> Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. ^{ccii}	Chimney or Digger Crayfish: (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish: (<i>Cambarus Diogenes</i>)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM	Wet meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. <u>Information Sources</u> • Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites ^{cci} • Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH • Surveys should be done April to August during in temporary or permanent water Note the presence of burrows or chemistry are often the only indicator of presence, observance or collection of individuals is very difficult ^{cci} • SWHMiST ^{cxlix} Index #36 provides development effects and mitigation measures.	The areas surrounding the marsh may provide suitable habitat for terrestrial crayfish.	

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	ELC Ecosites	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Special Concern and Rare Wildlife Species					Not Present	Not Present
<u>Rationale:</u> These species are quite rare or have experienced significant population declines in Ontario.	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites ^{lxxviii} . <u>Information Sources</u> • Natural Heritage Information Centre (NHIC) will have the Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. • NHIC Website: "Get Information": http://nhic.mnr.gov.on.ca • Ontario Breeding Bird Atlas ^{ccv} • Expert advice should be sought as many of the rare spp. have little information available about their requirements.	Studies Confirm: • Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs to be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. • SWHMiST ^{cxlix} Index #37 provides development effects and mitigation measures.	Suitable habitat for Special Concen and rare wildlife is not present within the proposed development areas which are annual row crop field and a small area of old field meadow. In general, the potential for rare species is very low within the study area.	

Significant Wildlife Habitat Assessment Tables

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E.

Rationale	Candidate SWH			Confirmed SWH		
	Wildlife Species	Habitat Description	Detailed Information and Sources	Defining Criteria	Study Area	Subject Property
Wildlife Habitat: Amphibian Movement Corridors					Not Present	Not Present
Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1.	Movement corridors between breeding habitat and summer habitat ^{clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi} . Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule ^l . <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center NHIC • Reports and other information available from CAs • Field Naturalist Clubs	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant ^{cxlix} . • Corridors should have at least 15m of vegetation on both sides of waterway ^{cxlix} or be up to 200m wide ^{cxlix} of woodland habitat and with gaps <20m ^{cxlix} . • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat ^{cxlix} . • SWHMiST ^{cxlix} Index #40 provides development effects and mitigation measures.	Suitable conditions are not present for an amphibian movement corridor.	
Wildlife Habitat: Deer Movement Corridors					Not Present	Not Present
Rationale: Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule ^l . • A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion ^{clxxxii, clxxxiii, cxlix, cxliv} . • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> • MNRF District Office • Natural Heritage Information Center (NHIC) • Reports and other information available from CAs • Field Naturalist Clubs	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas. • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide ^{cxlix} with gaps <20m ^{cxlix} and if following riparian area with at least 15m of vegetation on both sides of waterway ^{cxlix} . Shorter corridors are more significant than longer corridors ^{cxlix} . • SWHMiST ^{cxlix} Index #39 provides development effects and mitigation measures.	Suitable conditions are not present for a deer movement corridor.	

APPENDIX IV
Flora and Fauna Reported from the Study Area

Plant Species Reported from the Study Area

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Waterloo Region	NHIC Data	NRSI Observed
		MNRF 2025	MECP 2024	Government of Canada 2025			Richardson & Martin 1999	MNRF 2025	
Gymnosperms	Conifers								
Cupressaceae	Cypress Family								
<i>Juniperus virginiana</i>	Eastern Red Cedar	S5							X
<i>Thuja occidentalis</i>	Eastern White Cedar	S5							X
Pinaceae	Pine Family								
<i>Picea glauca</i>	White Spruce	S5					R+		X
<i>Picea pungens</i>	Blue Spruce	SE1							X
<i>Pinus nigra</i>	Black Pine	SE3							X
<i>Pinus sylvestris</i>	Scots Pine	SE5							X
Dicotyledons	Dicots								
Aceraceae	Maple Family								
<i>Acer negundo</i>	Manitoba Maple	S5							X
<i>Acer platanoides</i>	Norway Maple	SE5							X
<i>Acer rubrum</i>	Red Maple	S5							X
Asteraceae	Composite or Aster Family								
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5							X
<i>Solidago</i> sp.	Goldenrod sp.								X
<i>Symphyotrichum lanceolatum</i>	Panicled Aster	S5							X
<i>Symphyotrichum lateriflorum</i>	Calico Aster	S5							X
<i>Symphyotrichum novae-angliae</i>	New England Aster	S5							X
<i>Symphyotrichum puniceum</i>	Swamp Aster	S5							X
Caprifoliaceae	Honeysuckle Family								
<i>Viburnum lantana</i>	Wayfaring-tree	SE2							X
Cornaceae	Dogwood Family								
<i>Cornus racemosa</i>	Gray Dogwood	S5							X
<i>Cornus sericea</i>	Red-osier Dogwood	S5							X
<i>Quercus macrocarpa</i>	Bur Oak	S5							X
<i>Quercus rubra</i>	Northern Red Oak	S5							X
Juglandaceae	Walnut Family								
<i>Juglans cinerea</i>	Butternut	S2?	END	E	E	Schedule 1		X	
<i>Juglans nigra</i>	Black Walnut	S4?					R+*		X
Moraceae	Mulberry Family								
<i>Morus alba</i>	White Mulberry	SE5							X
Oleaceae	Olive Family								
<i>Fraxinus americana</i>	White Ash	S4							X
<i>Fraxinus pennsylvanica</i>	Green Ash	S4							X
Rhamnaceae	Buckthorn Family								
<i>Frangula alnus</i>	Glossy Buckthorn	SE5							X
<i>Rhamnus cathartica</i>	Common Buckthorn	SE5							X
Rosaceae	Rose Family								
<i>Agrimonia eupatoria</i>	European Agrimony	SE1							X
<i>Geum</i> sp.	Avens sp.								X

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Waterloo Region	NHIC Data	NRSI Observed
<i>Malus pumila</i>	Common Apple	SE4							X
<i>Prunus avium</i>	Sweet Cherry	SE4							X
<i>Sorbus aucuparia</i>	European Mountain-ash	SE4							X
Salicaceae	Willow Family								
<i>Populus tremuloides</i>	Trembling Aspen	S5							X
<i>Salix</i> sp.	Willow sp.								X
<i>Salix discolor</i>	Pussy Willow	S5							X
<i>Salix interior</i>	Sandbar Willow	S5							X
<i>Salix x sepulcralis</i>	(<i>Salix alba</i> X <i>Salix babylonica</i>)	SNA							X
Tiliaceae	Linden Family								
<i>Tilia americana</i>	American Basswood	S5							X
Ulmaceae	Elm Family								
<i>Ulmus americana</i>	American Elm	S5							X
Monocotyledons	Monocots								
Lemnaceae	Duckweed Family								
<i>Lemna minor</i>	Lesser Duckweed	S5							X
Poaceae	Grass Family								
<i>Bromus inermis</i>	Smooth Brome	SE5							X
<i>Dactylis glomerata</i>	Orchard Grass	SE5							X
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5							X
<i>Phragmites australis</i> ssp. <i>australis</i>	European Reed	SE5							X
<i>Poa pratensis</i>	Kentucky Bluegrass	S5							X
Typhaceae	Cattail Family								
<i>Typha angustifolia</i>	Narrow-leaved Cattail	SE5							X
<i>Typha latifolia</i>	Broad-leaved Cattail	S5							X
Total								1	46

Species List Legend

Provincial Ranks									
SRANK									
S1	Critically Imperiled	S4	Apparently Secure	S#?	Uncertain Rank	SNR	Unranked	NP	Not Provided
S2	Imperiled	S5	Secure	SX	Presumed Extirpated	SU	Unrankable		
S3	Vulnerable	S#S#	Status is Between Ranks	SH	Possibly Extirpated (Historical)	SNA	Not Applicable		
SARO									
END	Endangered	SC	Special Concern	DD	Data Deficient				
THR	Threatened	NAR	Not at Risk	EXP	Extirpated				
Federal Ranks									
COSEWIC and SARA									
E	Endangered	SC	Special Concern	NS	No Status	N-A	Non-Active	EX	Extirpated
T	Threatened	NAR	Not at Risk	DD	Data Deficient	X	Extinct		
SARA Schedule									
Schedule 1	Extirpated, Endangered, Threatened, Special Concern Species officially protected under SARA								
Schedule 2	Endangered, Threatened species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Schedule 3	Special Concern species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Waterloo Region Status									
Vascular Plants (Richardson and Martin 1999)									
R	Rare, one to twelve extant site occurrences	+	significant only if native - most populations in RMW are thought to be non-native	*	significant but with the expectation that additional research may prove otherwise	#	significant but known RMW reports are treated as hypothetical		

Bird Species Reported from the Study Area

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	OBBA	NHIC Data	NRSI Observed
		MNRF 2025	MECP 2024	Government of Canada 2025			Martin 1996	BSC et al. 2006	MNRF 2025	
Anatidae	Ducks, Geese & Swans									
<i>Aix sponsa</i>	Wood Duck	S5B,S3N					√*	CO		
<i>Anas platyrhynchos</i>	Mallard	S5						CO		X
<i>Anas rubripes</i>	American Black Duck	S4					√	PR		
<i>Branta canadensis</i>	Canada Goose	S5						CO		X
<i>Spatula discors</i>	Blue-winged Teal	S3B,S4M						PR		
Phasianidae	Partridges, Grouse & Turkeys									
<i>Bonasa umbellus</i>	Ruffed Grouse	S5						PO		
<i>Meleagris gallopavo</i>	Wild Turkey	S5						PR		
Podicipediformes	Grebes									
<i>Podilymbus podiceps</i>	Pied-billed Grebe	S4B,S2N					√	PR		X
Columbidae	Pigeons & Doves									
<i>Columba livia</i>	Rock Pigeon	SNA						PR		
<i>Zenaidura macroura</i>	Mourning Dove	S5						CO		X
Cuculiformes	Cuckoos & Anis									
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	S4B					√	PR		
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	S4S5B					√	PR		
Apodidae	Swifts									
<i>Chaetura pelagica</i>	Chimney Swift	S3B	THR	T	T	Schedule 1		PR		
Trochilidae	Hummingbirds									
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	S5B					√	CO		
Rallidae	Rails, Gallinules & Coots									
<i>Fulica americana</i>	American Coot	S3B,S4N	NAR	NAR	NS	No schedule	√	PO		
<i>Gallinula galeata</i>	Common Gallinule	S3B					√	PO		
<i>Porzana carolina</i>	Sora	S5B					√	PR		X
<i>Rallus limicola</i>	Virginia Rail	S4S5B					√	PR		
Charadriidae	Plovers & Lapwings									
<i>Charadrius vociferus</i>	Killdeer	S4B						CO		X
Scolopacidae	Sandpipers & Allies									
<i>Actitis macularia</i>	Spotted Sandpiper	S5B						CO		X
<i>Bartramia longicauda</i>	Upland Sandpiper	S2B					√	PO		
<i>Gallinago delicata</i>	Wilson's Snipe	S5B					√	PO		
<i>Scolopax minor</i>	American Woodcock	S4B						PO		X
Ardeidae	Hérons & Bitterns									
<i>Ardea herodias</i>	Great Blue Heron	S4					√	PO		X
<i>Botaurus lentiginosus</i>	American Bittern	S5B					√	PO		X
<i>Butorides virescens</i>	Green Heron	S4B					√	PR		X
Cathartidae	Vultures									
<i>Cathartes aura</i>	Turkey Vulture	S5B,S3N					√	PO		
Pandionidae	Osprey									
<i>Pandion haliaetus</i>	Osprey	S5B					√	CO		
Accipitridae	Hawks, Kites, Eagles & Allies									
<i>Accipiter cooperii</i>	Cooper's Hawk	S4	NAR	NAR	NS	No schedule	√	PO		
<i>Accipiter striatus</i>	Sharp-shinned Hawk	S5	NAR	NAR	NS	No schedule	√	CO		
<i>Buteo jamaicensis</i>	Red-tailed Hawk	S5	NAR	NAR	NS	No schedule		CO		X
<i>Buteo lineatus</i>	Red-shouldered Hawk	S4B,S2N	NAR	NAR			√	PO		

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	OBBA	NHIC Data	NRSI Observed
<i>Circus hudsonius</i>	Northern Harrier	S5B,S4N	NAR	NAR	NS	No schedule	√	PO		
Strigidae		Typical Owls								
<i>Bubo virginianus</i>	Great Horned Owl	S4						CO		
<i>Megascops asio</i>	Eastern Screech-Owl	S4	NAR	NAR	NS	No schedule		CO		
Alcedinidae		Kingfishers								
<i>Megaceryle alcyon</i>	Belted Kingfisher	S5B,S4N					√	CO		
Picidae		Woodpeckers								
<i>Colaptes auratus</i>	Northern Flicker	S5						CO		X
<i>Dryobates pubescens</i>	Downy Woodpecker	S5						CO		X
<i>Dryobates villosus</i>	Hairy Woodpecker	S5						CO		
<i>Dryocopus pileatus</i>	Pileated Woodpecker	S5					√	PR		
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	S5					√	PO		
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	S5B,S3N					√	PR		
Falconidae		Caracaras & Falcons								
<i>Falco sparverius</i>	American Kestrel	S4						PR		
Tyrannidae		Tyrant Flycatchers								
<i>Contopus virens</i>	Eastern Wood-Pewee	S4B	SC	SC	SC	Schedule 1		CO		
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B					√	PO		X
<i>Empidonax minimus</i>	Least Flycatcher	S5B					√	PR		
<i>Empidonax traillii</i>	Willow Flycatcher	S4B						PO		X
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	S5B						CO		
<i>Sayornis phoebe</i>	Eastern Phoebe	S5B						PR		
<i>Tyrannus tyrannus</i>	Eastern Kingbird	S4B						CO		X
Vireonidae		Vireos								
<i>Vireo gilvus</i>	Warbling Vireo	S5B						CO		X
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B						CO		
<i>Vireo solitarius</i>	Blue-headed Vireo	S5B						PO		
Corvidae		Crows & Jays								
<i>Corvus brachyrhynchos</i>	American Crow	S5						CO		X
<i>Cyanocitta cristata</i>	Blue Jay	S5						CO		X
Alaudidae		Larks								
<i>Eremophila alpestris</i>	Horned Lark	S4						PR		X
Hirundinidae		Swallows								
<i>Hirundo rustica</i>	Barn Swallow	S4B	SC	SC	T	Schedule 1		CO		X
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	S4S5B					√*	CO		X
<i>Riparia riparia</i>	Bank Swallow	S4B	THR	T	T	Schedule 1		CO		
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	S4B						PO		X
<i>Tachycineta bicolor</i>	Tree Swallow	S4S5B						CO		X
Paridae		Chickadees & Titmice								
<i>Poecile atricapillus</i>	Black-capped Chickadee	S5						CO		
Sittidae		Nuthatches								
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S5					√	PO		
<i>Sitta carolinensis</i>	White-breasted Nuthatch	S5						CO		
Certhiidae		Creepers								
<i>Certhia americana</i>	Brown Creeper	S5					√	PR		
Troglodytidae		Wrens								
<i>Thryothorus ludovicianus</i>	Carolina Wren	S4					√	PO		
<i>Troglodytes aedon</i>	House Wren	S5B						CO		X

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	OBBA	NHIC Data	NRSI Observed
Poliophtidae	Gnatcatchers									
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	S4B					√	CO		
Regulidae	Kinglets									
<i>Regulus satrapa</i>	Golden-crowned Kinglet	S5					√	PR		
Turdidae	Thrushes									
<i>Catharus fuscescens</i>	Veery	S5B					√	PR		
<i>Hylocichla mustelina</i>	Wood Thrush	S4B	SC	T	T	Schedule 1		CO		
<i>Turdus migratorius</i>	American Robin	S5						CO		X
Mimidae	Mockingbirds, Thrashers & Allies									
<i>Dumetella carolinensis</i>	Gray Catbird	S5B, S3N						CO		X
<i>Toxostoma rufum</i>	Brown Thrasher	S4B					√	CO		
Sturnidae	Starlings									
<i>Sturnus vulgaris</i>	European Starling	SNA						CO		X
Bombycillidae	Waxwings									
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5						CO		X
Passeridae	Old World Sparrows									
<i>Passer domesticus</i>	House Sparrow	SNA						CO		
Fringillidae	Finches & Allies									
<i>Haemorhous mexicanus</i>	House Finch	SNA						PR		
<i>Spinus tristis</i>	American Goldfinch	S5						CO		X
Passerellidae	New World Sparrows & Allies									
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	S4B	SC	SC	SC	Schedule 1	√	PO		
<i>Melospiza georgiana</i>	Swamp Sparrow	S5B, S4N						PO		X
<i>Melospiza melodia</i>	Song Sparrow	S5						CO		X
<i>Passerculus sandwichensis</i>	Savannah Sparrow	S5B, S3N						CO		X
<i>Pooecetes gramineus</i>	Vesper Sparrow	S4B					√	PR		
<i>Spizella passerina</i>	Chipping Sparrow	S5B, S3N						PR		X
<i>Spizella pusilla</i>	Field Sparrow	S4B, S3N						PR		
Icteridae	Troupials & Allies									
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	S5						CO		X
<i>Dolichonyx oryzivorus</i>	Bobolink	S4B	THR	SC	T	Schedule 1		PR	X	
<i>Icterus galbula</i>	Baltimore Oriole	S4B						CO		X
<i>Icterus spurius</i>	Orchard Oriole	S4B					√	PR		
<i>Molothrus ater</i>	Brown-headed Cowbird	S5						CO		X
<i>Quiscalus quiscula</i>	Common Grackle	S5						CO		X
<i>Sturnella magna</i>	Eastern Meadowlark	S4B, S3N	THR	T	T	Schedule 1		PR	X	
Parulidae	Wood Warblers									
<i>Geothlypis philadelphia</i>	Mourning Warbler	S5B					√	PO		
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B, S3N						PR		X
<i>Leiothlypis ruficapilla</i>	Nashville Warbler	S5B					√	PO		
<i>Parkesia noveboracensis</i>	Northern Waterthrush	S5B					√	PO		
<i>Seiurus aurocapilla</i>	Ovenbird	S5B					√	PR		
<i>Setophaga coronata</i>	Yellow-rumped Warbler	S5B, S4N					√	PO		
<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler	S5B					√	CO		
<i>Setophaga petechia</i>	Yellow Warbler	S5B						CO		X
<i>Setophaga pinus</i>	Pine Warbler	S5B, S3N					√	PR		
<i>Setophaga ruticilla</i>	American Redstart	S5B					√	PR		X
<i>Setophaga virens</i>	Black-throated Green Warbler	S5B					√	PO		
<i>Vermivora cyanoptera</i>	Blue-winged Warbler	S4B					√	PR		

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	OBBA	NHIC Data	NRSI Observed
Cardinalidae	Cardinals, Grosbeaks & Allies									
<i>Cardinalis cardinalis</i>	Northern Cardinal	S5						CO		X
<i>Passerina cyanea</i>	Indigo Bunting	S5B						CO		
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	S5B						CO		
<i>Piranga olivacea</i>	Scarlet Tanager	S5B					√	PR		
Total								111	2	44

Species List Legend

Provincial Ranks									
SRANK									
S1	Critically Imperiled	S4	Apparently Secure	S#?	Uncertain Rank	SNR	Unranked	NP	Not Provided
S2	Imperiled	S5	Secure	SX	Presumed Extirpated	SU	Unrankable		
S3	Vulnerable	S#S#	Status is Between Ranks	SH	Possibly Extirpated (Historical)	SNA	Not Applicable		
SARO									
END	Endangered	SC	Special Concern	DD	Data Deficient				
THR	Threatened	NAR	Not at Risk	EXP	Extirpated				
Federal Ranks									
COSEWIC and SARA									
E	Endangered	SC	Special Concern	NS	No Status	N-A	Non-Active	EX	Extirpated
T	Threatened	NAR	Not at Risk	DD	Data Deficient	X	Extinct		
SARA Schedule									
Schedule 1	Extirpated, Endangered, Threatened, Special Concern Species officially protected under SARA								
Schedule 2	Endangered, Threatened species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Schedule 3	Special Concern species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Birds (Martin 1996)									
√	Regionally significant	√*	Significant when nesting in natural circumstances						

Reptile and Amphibian Species Reported from the Study Area

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	ORAA	NHIC Data	NRSI Observed
		MNRF 2025	MECP 2024	Government of Canada 2025			RMOW 1985	Ontario Nature 2019	MNRF 2025	
Turtles										
Chelydra serpentina	Snapping Turtle	S4	SC	SC	SC	Schedule 1	C	X	X	X
Chrysemys picta marginata	Midland Painted Turtle	S4		SC	SC	Schedule 1	C	X		X
Snakes										
Lampropeltis triangulum	Eastern Milksnake	S4	NAR	SC	SC	Schedule 1	√	X		
Opheodrys vernalis	Smooth Greensnake	S4					√	X		
Storeria dekayi	Dekay's Brownsnake	S5	NAR	NAR	NS	No schedule	C*	X		
Storeria occipitomaculata	Red-bellied Snake	S5					C*	X		
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5					C	X		X
Salamanders										
Ambystoma maculatum	Spotted Salamander	S4					√	X		
Necturus maculosus	Mudpuppy	S4	NAR	N-A	NS	No schedule	√	X		
Plethodon cinereus	Eastern Red-backed Salamander	S5					C	X		
Frogs and Toads										
Anaxyrus americanus	American Toad	S5					C	X		X
Dryophytes versicolor	Gray Treefrog	S5					C	X		X
Pseudacris triseriata pop. 2	Western Chorus Frog (GLSL - CS pop.)	S4	NAR	T	T	Schedule 1			X	
Pseudacris crucifer	Spring Peeper	S5					C	X		X
Lithobates catesbeianus	American Bullfrog	S4					√	X		
Lithobates clamitans	Green Frog	S5					C	X		X
Lithobates palustris	Pickerel Frog	S4	NAR	NAR	NS	No schedule	√	X		
Lithobates pipiens	Northern Leopard Frog	S5	NAR	NAR	NS	No schedule	C	X		X
Lithobates sylvaticus	Wood Frog	S5					C	X		X
Total								18	2	9

Species List Legend

Provincial Ranks									
SRANK									
S1	Critically Imperiled	S4	Apparently Secure	S#?	Uncertain Rank	SNR	Unranked	NP	Not Provided
S2	Imperiled	S5	Secure	SX	Presumed Extirpated	SU	Unrankable		
S3	Vulnerable	S#S#	Status is Between Ranks	SH	Possibly Extirpated (Historical)	SNA	Not Applicable		
SARO									
END	Endangered	SC	Special Concern	DD	Data Deficient				
THR	Threatened	NAR	Not at Risk	EXP	Extirpated				
Federal Ranks									
COSEWIC and SARA									
E	Endangered	SC	Special Concern	NS	No Status	N-A	Non-Active	EX	Extirpated
T	Threatened	NAR	Not at Risk	DD	Data Deficient	X	Extinct		
SARA Schedule									
Schedule 1	Extirpated, Endangered, Threatened, Special Concern Species officially protected under SARA								
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Schedule 3	Special Concern species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1								
Herpetofauna (Regional Municipality of Waterloo 1985)									
C	Common	C*	Thought to be common, difficult to find	√	Regionally significant				

Mammal Species Reported from the Study Area

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	Ontario Mammal Atlas	NHIC Data	NRSI Observed
		MNRF 2025	MECP 2024	Government of Canada 2025			RMOW 1985	Dobbyn 1994	MNRF 2025	
Didelphimorphia	Opossums									
<i>Didelphis virginiana</i>	Virginia Opossum	S4					R	X		
Eulipotyphla	Shrews, Moles, Hedgehogs, and Allies									
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	S5						X		
<i>Condylura cristata</i>	Star-nosed Mole	S5						X		
<i>Parascalops breweri</i>	Hairy-tailed Mole	S4					R	X		
<i>Sorex cinereus</i>	Masked Shrew	S5					G	X		
<i>Sorex fumeus</i>	Smoky Shrew	S5					R	X		
<i>Sorex palustris</i>	Water Shrew	S5					R	X		
Chiroptera	Bats									
<i>Eptesicus fuscus</i>	Big Brown Bat	S4						X		
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	S3	END	E	NS	No schedule		X		
<i>Lasiurus borealis</i>	Eastern Red Bat	S3	END	E	NS	No schedule		X		
<i>Lasiurus cinereus</i>	Hoary Bat	S3	END	E	NS	No schedule		X		
<i>Myotis leibii</i>	Eastern Small-footed Myotis	S2S3	END					X		
<i>Myotis lucifugus</i>	Little Brown Myotis	S3	END	E	E	Schedule 1		X		
<i>Myotis septentrionalis</i>	Northern Myotis	S3	END	E	E	Schedule 1		X		
<i>Perimyotis subflavus</i>	Tri-colored Bat	S3?	END	E	E	Schedule 1		X		
Lagomorpha	Rabbits and Hares									
<i>Lepus americanus</i>	Snowshoe Hare	S5					S	X		
<i>Lepus europaeus</i>	European Hare	SNA						X		
<i>Sylvilagus floridanus</i>	Eastern Cottontail	S5						X		X
Rodentia	Rodents									
<i>Castor canadensis</i>	Beaver	S5					S	X		
<i>Erethizon dorsatum</i>	Porcupine	S5					S	X		
<i>Glaucomys sabrinus</i>	Northern Flying Squirrel	S5					R	X		
<i>Marmota monax</i>	Woodchuck	S5						X		
<i>Microtus pennsylvanicus</i>	Meadow Vole	S5						X		
<i>Microtus pinetorum</i>	Woodland Vole	S3?	SC	SC	SC	Schedule 1		X		
<i>Mus musculus</i>	House Mouse	SNA						X		
<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	S5						X		
<i>Ondatra zibethicus</i>	Muskrat	S4						X		
<i>Peromyscus leucopus</i>	White-footed Mouse	S5						X		
<i>Peromyscus maniculatus</i>	Deer Mouse	S5						X		
<i>Rattus norvegicus</i>	Norway Rat	SNA						X		
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	S5						X		
<i>Synaptomys cooperi</i>	Southern Bog Lemming	S4					R	X		
<i>Tamias striatus</i>	Eastern Chipmunk	S5						X		
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	S5						X		
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	S5						X		
Canidae	Canines									
<i>Canis latrans</i>	Coyote	S5					S	X		
<i>Vulpes vulpes</i>	Red Fox	S5						X		
Felidae	Felines									
<i>Lynx rufus</i>	Bobcat	S4					R	X		
Mephitidae	Skunks and Stink Badgers									
<i>Mephitis mephitis</i>	Striped Skunk	S5						X		

Scientific Name	Common Name	S-Rank	SARO	COSEWIC	SARA	SARA Schedule	Region of Waterloo	Ontario Mammal Atlas	NHIC Data	NRSI Observed
Mustelidae	Weasels and Allies									
<i>Mustela richardsonii</i>	American Ermine	S5						X		
<i>Neogale frenata</i>	Long-tailed Weasel	S4					S	X		
<i>Neogale vison</i>	American Mink	S4					S	X		
<i>Taxidea taxus jacksoni</i>	American Badger (SW Ontario pop.)	S1	END	E	E	Schedule 1		X		
Procyonidae	Raccoons and Allies									
<i>Procyon lotor</i>	Northern Raccoon	S5						X		X
Ursidae	Bears									
<i>Ursus americanus</i>	American Black Bear	S5	NAR	NAR	NS	No schedule		X		
Artiodactyla	Deer and Bison									
<i>Odocoileus virginianus</i>	White-tailed Deer	S5						X		X
Total								46	0	3

Species List Legend

Provincial Ranks									
SRANK									
S1	Critically Imperiled	S4	Apparently Secure	S#?	Uncertain Rank	SNR	Unranked	NP	Not Provided
S2	Imperiled	S5	Secure	SX	Presumed Extirpated	SU	Unrankable		
S3	Vulnerable	S#S#	Status is Between Ranks	SH	Possibly Extirpated (Historical)	SNA	Not Applicable		
SARO									
END	Endangered	SC	Special Concern	DD	Data Deficient				
THR	Threatened	NAR	Not at Risk	EXP	Extirpated				
Federal Ranks									
COSEWIC and SARA									
E	Endangered	SC	Special Concern	NS	No Status	N-A	Non-Active	EX	Extirpated
T	Threatened	NAR	Not at Risk	DD	Data Defficient	X	Extinct		
SARA Schedule									
Schedule 1 Extirpated, Endangered, Threatened, Special Concern Species officially protected under SARA									
Schedule 2 Endangered, Threatened species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1									
Schedule 3 Special Concern species not yet re-assessed using revised criteria; may be considered for inclusion to Schedule 1									
Mammals (Regional Municipality of Waterloo 1985)									
G	General	O	Occasional	S	Scarce	R	Rare		